

Voxware: In the Vortex of Internet Telephony

by Barbara Fox

In the 1920s telephones changed the way everyone did business. In the 1980s personal computers started a similar revolution. Now it's possible that in the next five years your telephone and your PC will morph into one piece of equipment. Thanks to the Internet you would be able to make phone calls — to talk with your fellow workers or prospective clients while you work on the same file, to verbally answer questions in real time when a customer is looking at your Web page, or to teleconference with dozens of your cohorts — all virtually free.

"When the Internet started it was viewed as something strange and different," says Michael Goldstein, CEO of Voxware, the College-Road based firm that is jostling for position in the race for Web technology profits. "Now E-mail has blended into the tools that we take for granted, just as we take for granted the fax, or Federal Express, or the phone, or the word processor. Packet voice — the technology used for phones on the Internet — will be part of our everyday experience of working."

How long will that take? "We are probably three to five years away from the experience," says Goldstein. In the meantime, he suggests, Internet telephony will be used for niche applications: "It's going to start as a broadly used capability for narrow applications and become more and more mainstream over time. A few years from now we won't think of it as anything odd."

Michael Goldstein will speak at the U.S. 1 Computer Expo and Showcase on Thursday, July 24, at Novotel on Route 1 North. Two dozen exhibitors will show their technology from 4 to 7 p.m., and at 5:15 p.m. Goldstein will speak about voice over Internet Protocol (IP) networks and demonstrate a just-released milestone product for Voxware, VoxChat, which can host up to 200 teleconference participants.

He will also discuss the state of Internet telephony — where it

came from, where it's going, and where Voxware fits in. Naysayers complain about the quality and speed of Internet telephony, and such mega competitors as Lucent Technologies loom large. But Goldstein says his firm has the capacity to move swiftly in a fast-changing marketplace, and its particular strength is its high quality voice compression algorithms that work well for low band widths — even for the slowest modems.

"We build the guts of the platform and a few enabling applications," says Goldstein, adding that most other companies concentrate on just the applications. "They don't do the lowest level, the signal processing algorithms. We've built expertise in the compression area and the application area that is clearly the best in the world."

In explaining Voxware's special compression methods Goldstein's favorite metaphor is the concept of sending a piece of apple pie from one computer screen to another. The first cook could take out the water with the usual compression methods and send the pie; the second cook would add water to the pie. But dehydrated food usually tastes awful. The Voxware solution: "Rather than take out the redundancies we would analyze the ingredients," says Goldstein, "and in real time the pie gets baked on the other end."

The technical explanation goes like this: Voxware compresses audio files at a ratio of about 53 to 1 or 44 to 1, depending on the user options. A call made from one Voxware phone to another can tap into Voxware's proprietary techniques to improve audio quality. Voxware's transmission technology also helps solve the problems inherent to computer networks. It continuously monitors network



performance and adjusts transmission parameters to maximize audio quality and provide real-time latency estimation. It estimates, compensates, and minimizes the varying delays through the computer networks and significantly improves conversational quality.

Founded four years ago, Voxware moved last summer to 18,000 square feet at 305 College Road. That's when U.S. 1 put Voxware on the cover in a feature called "Voice on the Net" (July 3, 1996). Voxware went public later that month and now trades on the Nasdaq as VOXW. Then it had 58 people; it now employs more than 90 people. Technology reviews that ranged from so-so to good last year have improved dramatically this year, with two raves last month. It was the subject of a major story in the New York Times (June 9) which called Voxware "an aging three-year-old" that is having

"an anxious and exhilarating run" based on "a combination of innovation, salesmanship, and even high-technology statesmanship."

Voxware can point to a growth of 625 percent in total revenues in one year; revenues for the three quarters ending in March were more than \$5 million, compared to \$707,000 for the same period last year. But like most Internet companies, it has yet to see black ink on its profit and loss sheet. The three quarter period ending in March showed a net loss of more than \$6 million, and the \$7.50 IPO price has gone as low as \$4 and is hovering this week at around \$5.

Still, Voxware thinks its current business plan — to license its technology to independent software vendors and companies that need voice or audio — will soon be profitable. It was one of the first companies to issue products based on new H.323 standards. Its clients include telephony gateway providers, component distributors, dis-

CEO Goldstein: Can Voxware's chief translate rave software reviews into a profitable business? Ask him at the U.S. 1 Showcase.

tance learning vendors, multimedia tool vendors, and game developers — all who require a low bandwidth voice and audio type of solution.

In addition, Voxware is putting its own products on the market to demonstrate what Joan Spindel, marketing vice president, calls the "sex and sizzle" of the technology. First it came out with a Web authoring tool, then an Internet phone, and on June 30 the firm premiered VoxChat, the interactive voice conferencing platform for the Internet. Invented by Voxware's application development group (headed by Matt Cole and Matt Krokosz) it offers free-form and moderated audio conferencing over IP networks for large-scale interactive voice conferencing solutions.

Says Spindel: "Minimizing the delay and choppiness often associated with speech over unreliable networks such as the Internet, VoxChat provides clear voice transmission for moderated events, social chat, and distance learning."

Many of these applications — specifically telecommuter conferences, distance learning, and training — need voice combined with graphics and data and are particularly suited to Internet use. Chat servers replacing text with voice can substitute for expensive phone links, and, if you thought Lotus Notes was useful, wait until you can work on the same docu-

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At the U.S. 1 Showcase Goldstein will speak about voice over the Internet and demonstrate Voxware's just-released milestone product, VoxChat, which can host up to 200 teleconference participants.

C & G Technologies

U.S. 1 ADVERTISING FEATURE

Backstage at the Showcase

Husband and wife and business partners, Carolyn and Gunter Beck founded C&G Technologies in 1994 on the basis that technology should work for you. That philosophy is best exemplified in their MultiFunctional Document Server, the CG600 dxl+.

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What makes the CG600 dxl+ so remarkable is that, unlike its competition, it uses and maximizes today's computer technology. "We originally started as a software consulting firm, but as we were researching laser printers, we realized that with all of today's technology, a printer could do more," says Carolyn. "Multifunction centers existed, but were limited. We created

something that has unique superior size and design and more functions than the average multifunction center."

The inside of the CG600 dxl+ looks much like a laptop computer. The primary difference between a traditional MFC and the CG600 dxl+ is its hardware and software and how it works. Says Gunter, "A traditional laser printer relies much on the technology of old-line typewriters. We knew one could go a step further by relying on computer technology." In doing so, the groundbreaking CG600 dxl+ provides more functions and better upgradeability.

Traditional MFCs have one great disadvantage — when one item is down, the entire MFC is down. But with the CG600 dxl+ and its unique combination of hardware and

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Consider the traditional small office or home office. Multifunction centers can offer multiple functions for a single piece of equipment, ideal for maximizing space and use potential. But with the CG600 dxl+ and its LAN capabilities, that same multifunction center can also link workstations within the office and the office to the outside world.

One might assume that such a product would also have a price tag that's out of this world, but Gunter comments that even at office supply and discount stores you pay a premium for the name. The CG600

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The Becks attribute much of the development success of the CG600 dxl+ in its first year to the support and encouragement they received from the Technology Helpdesk and Incubator at Rutgers University.

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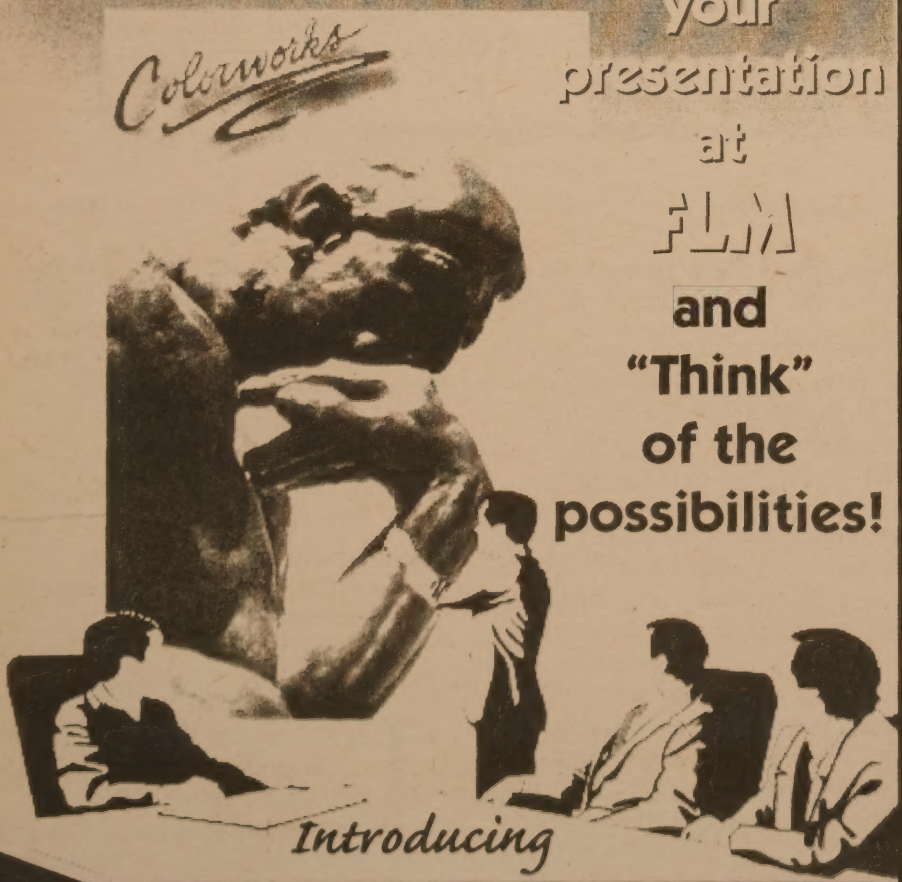
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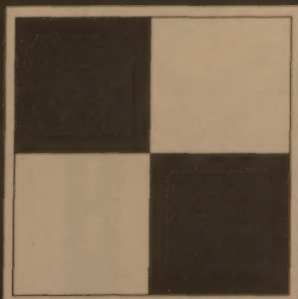
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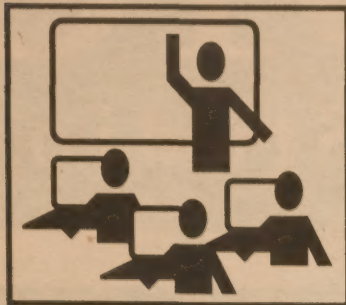
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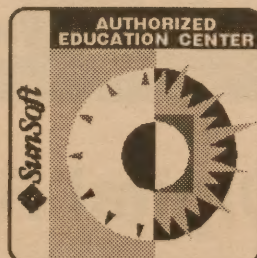
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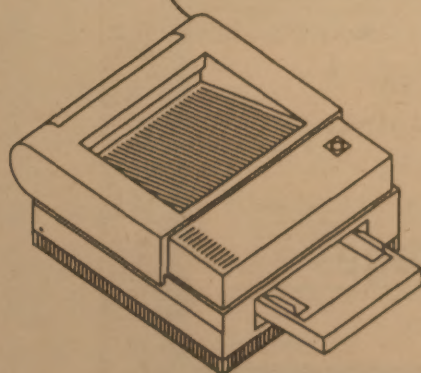
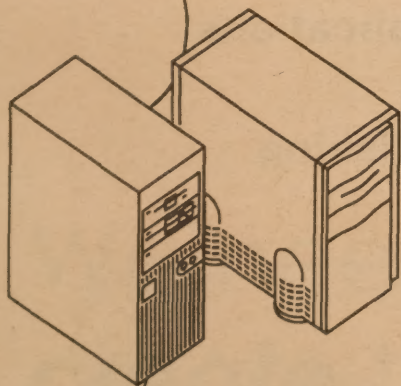
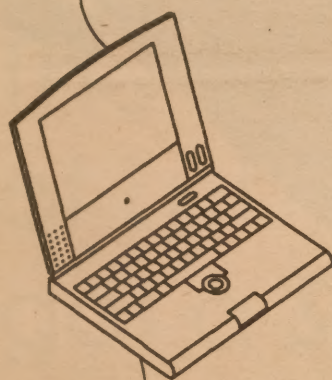
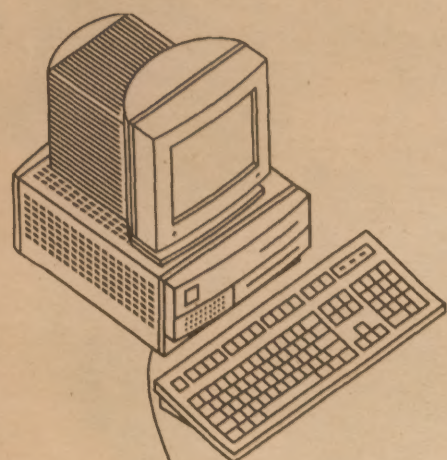
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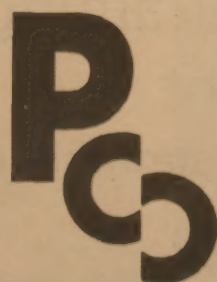
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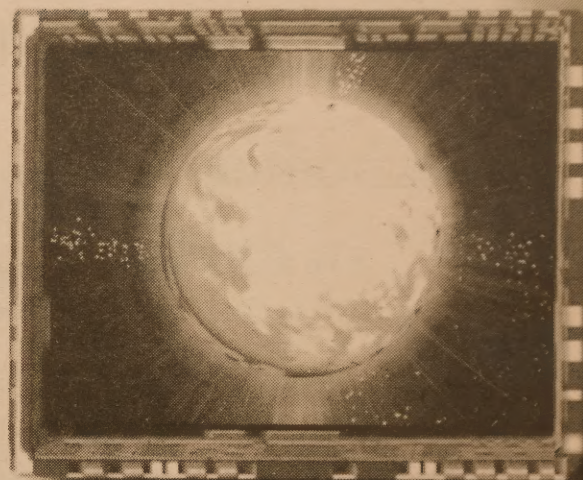


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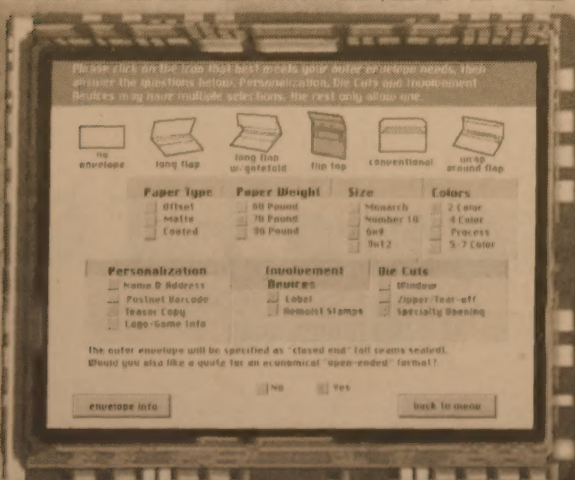
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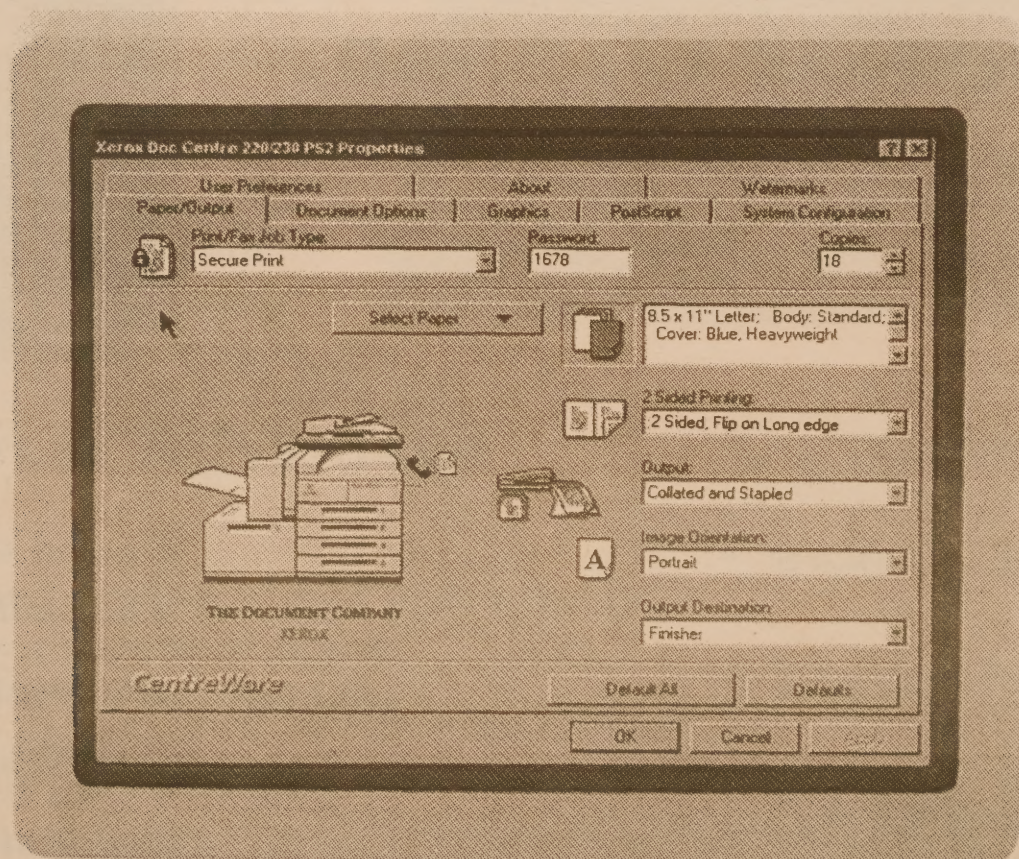
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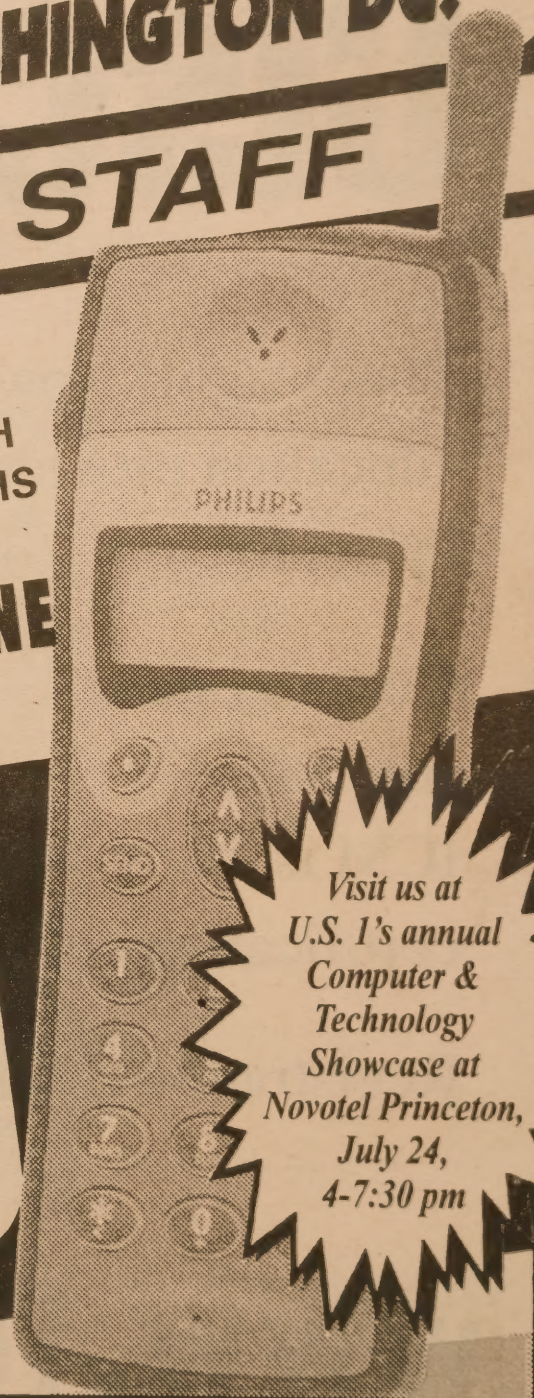
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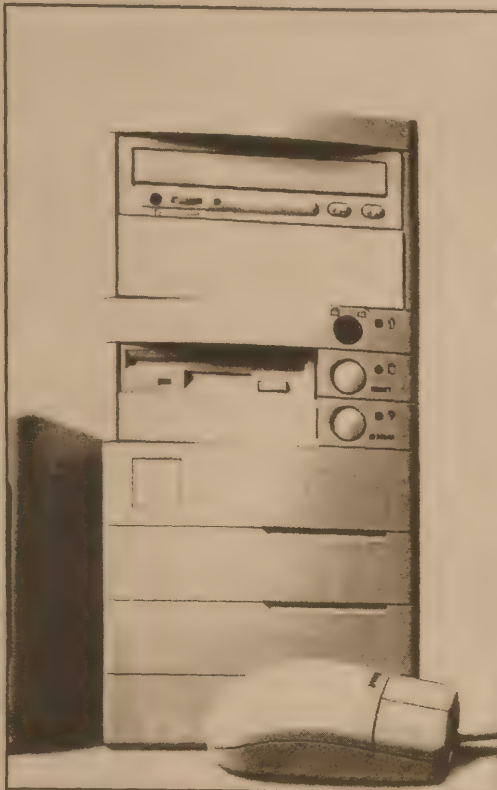
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<ul style="list-style-type: none"> ASUS motherboard 133MHz Intel Pentium CPU 512K pipeline burst cache 1.44 Floppy 8 MB RAM 1.2 GB Western Digital Hard drive Trident 1-meg Video card 16X CD rom drive Win 95 Keyboard Microsoft mouse Mini Tower Case 	<ul style="list-style-type: none"> ASUS motherboard 133MHz Intel Pentium CPU 512K pipeline burst cache 1.44 Floppy 16 MB RAM 1.2 GB Western Digital Hard drive Trident 1-MB Video card 16 bit Sound Blaster PnP + Spkrs 33.6 Kps Voice Modem 16X CD rom drive Win 95 Keyboard Microsoft mouse 14" SVGA monitor .28 resolution Mini Tower Case 	<ul style="list-style-type: none"> ASUS motherboard 166MHz Intel Pentium CPU 512K pipeline burst cache 1.44 Floppy 16 MB RAM 2.1GB Western Digital H/D Trident 2-MB Video card 32 bit Sound Blaster PnP 33.6 Kps Modem US Robotics 16X CD rom drive Win 95 Keyboard Microsoft mouse 14" SVGA monitor .28 resolution Mini Tower Case Dynamic Stereo speakers 	<ul style="list-style-type: none"> SUPER MICRO made in the USA Intel Pentium CPU 200MHz MMX 512K pipeline burst cache 1.44 Floppy 32 MB RAM 3.1GB Western Digital H/D ATI 3D Pro-turbo 8MB SGRAM PC 2TV 32Bit AWE Sound Blaster PnP 56 Kps Modem US Robotics 20X CD rom drive Win 95 Keyboard Microsoft mouse Deluxe Minitower case Dynamic Stereo speakers 	<ul style="list-style-type: none"> Dual Pentium Pro motherboard Super Micro Intel Pentium Pro 200MHz 64 bit data bus for highest performance 512K pipeline burst cache Zip drive built in internally, • 1.44 Floppy 64 MB RAM SCSI Ultra Wide Adaptec 2940 UW 4.3 GB Quantum Hard drive Ultra SCSI Matrox Millennium w/ 8MB ram 64 AWE bit Sound Blaster PnP Separate speakers 56 Kps Modem US Robotics 24X CD rom drive Deluxe Minitower case Win 95 Keyboard, • Microsoft mouse Viewsonic 17" .25 pitch 1600x1200 resolut. SUPER MICRO board made in the USA
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Continued from page 1

ment and talk about it too, all on one call.

"VoxChat lets up to 200 people, currently, have a single conversation over the Internet — or 100 people to have 20 conversations," says Goldstein. Because VoxChat is "scalable" (it works for both small and large groups) it is well-suited to these big symposia.

"Unlike standard Internet broadcasting systems," says Goldstein, "interactive VoxChat allows you to both talk and listen to other online users."

Those who stage large conferences must pay a fee, but the VoxChat moderating software is free for groups of up to five people, and any conference participant can download the basic software for free (<http://www.voxware.com>). If your computer has an eight bit sound card with full-duplex drivers (so you can send and receive simultaneously), plus a microphone and a speaker or headset, you can go on the Internet, download the VoxChat Client software, and join an online discussion ranging from sex to sociology. Other minimum system requirements: a Pentium 75 MHz PC, 8 MB RAM, 5 MB disk space, 256 color monitor, Winsock 1.1, and Internet access (direct or dialup SLIP or PPP connection).

Log into verbal social chat communities, Internet talk radio, special interest chat rooms, or celebrity and event webcasting. You can talk and listen at the same time; and you will not be restricted by your finger dexterity because (hurrah!) you won't have to type if you don't want to. And unless you count Internet phone charges and local phone call costs, it's absolutely free.

Voxware has hosted confer-

ences for ThinkQuest (a women with disabilities conference) and for Friday Night Ministries. Look at Voxware's Web page for places where you can talk with your VoxChat software, but start out with such regularly scheduled events as Singles Night (Thursdays from 8 p.m. to midnight); the Locker Room sports chat (Thursdays at 2 p.m.); So You're the New

Among other features VoxChat displays a list of on-line users along with an indication of who is currently speaking.

WebMaster (Wednesdays at 2 p.m.), and the Friday Night Live Broadcast, from 8 to 11 p.m., a chat about the satellite, broadcast, and communications industries." VoxChat features include:

User list. The VoxChat client displays a list of on-line users along with an indication of who is currently speaking.

Push-to-Talk Interface. Users signal their desire to speak using this convenient interface.

Ignore User Capability. Users can be individually muted.

Chat Rooms. Rooms can be created, and each room can be an independent conference and may be public or private.

Invitations. Conference participants may invite others to participate in "room specific" conversations.

Text Chat. In addition to voice, conference participants can inter-

act within the conference by text messages.

Multiple simultaneous speakers. Up to four people can speak at once in a VoxChat conference.

You can also start your own discussion: VoxChat servers (available for Windows NT Server version 4.0) are free in the versions that accommodate two to five people, though for larger groups a fee is charged. "Because it takes advantage of Voxware's low-bandwidth voice compression and Quality of Transmission technology," says Goldstein, "VoxChat makes efficient use of networks and its audio quality is excellent."

VoxChat moderators can choose from a "host" or "token" system. The "token" or unmoderated system works automatically; it lets speakers talk on a first-come, first-serve basis and can be set up to support from one to four simultaneous speakers. When someone pushes the talk button, they are in essence requesting a token. Depending on how many simultaneous speakers are allowed, the requester may get a token and therefore the ability to speak or be placed in a queue to receive the next available token.

With the host system the moderator has control over who can speak and can block unwanted participants. The moderator always has a token and therefore always has the ability to speak. At someone's request the host can select that person and give them a token, enabling them to speak.

VoxChat has been licensed to Digicam (for integration and resale for voice-only clients of large scale broadcasting events), and the underlying technology, the Voxware Conferencing Platform, was li-

Continued on page 18

Internet's Dial Tone

T hose who complain about the sound and speed of Internet multimedia compare its quality to the dance of the pachyderms. As Wall Street Journal columnist Rich Jaroslovsky noted, everyone is so amazed to see an elephant dance they forget that it does not look like real ballet: "What's impressive is that it's being done at all, not that it's being done well."

Dennis Aull, vice president of Internet Communications at Lucent Technologies, insists there will be a fabulous future for telephone calls over the Internet Protocol (IP) network. Lucent has 400 employees researching its Internet strategy, and in comparing the IP network to what we know as a voice dial tone, Aull says that IP is really a multimedia dial tone, because it is ubiquitous.

In an industry conference sponsored last spring by Jeff Pulver of the Pulver Report (<http://www.pulver.com>), Aull recalled the days when a voice dial tone let one person talk to another person: "That's all it did. While it was immensely useful, voice dial tone really wasn't turned into a powerful business tool until people started adding applications to it. Voice mail, conferencing, call center — these value-added applications took voice dial tone into a

competitive tool for enterprises."

"We think the same thing is going to happen in the IP world," says Aull. "The real power and the real opportunity here will come from thinking about this stuff in a whole new way. It's not just about technology. It's about thinking about what problems business customers have today in being competitive, and how we can apply this technology to make our business customers more competitive? How

Voice dial tone really wasn't turned into a powerful business tool until people started adding applications to it. The same is expected for Internet telephony.

can they support their sales forces better? How can they get their marketing message out better? How can they do a better job of fulfilling their value proposition to their customers?"

A conferencing product, VoxChat, will be demonstrated at U.S. 1's Computer Showcase,

but single-call business applications will also be popular, especially among the "road warriors." Every business traveler knows about the hassles of calling from a pay phone or hotel room. Soon PC-net telephones will be able to handle data transmissions, E-mail, voice mail, and fax — plus real-time voice conversations — in a one-call session.

Internet telephony also has spe-

Continued on page 16

Haverford specializes in custom installations and presentation equipment rentals, sales, and service for onsite & traveling presentations & training; For Ernst & Young ICM designed a 3,500-desktop document management system that allows the accounting firm to share millions of documents.

Continued from page 2

Windows 95, Internetworking MS TCP/IP, Supporting MS SMS and Core Technologies of Exchange Server. Starting in September, Dow Jones Training Services will be offering three new Internet courses: MS Web Site Essentials Using Internet Information Server, Mastering Web Site Development Using MS Visual InterDev, and Creating and Configuring a Web Server Using MS Tools. Other Microsoft authorized courses include MS Visual Basic 5.0 Fundamentals and mastering MS Visual Basic 5.0.

UNIX/Solaris courses include a five-day UNIX/Solaris Essentials class, followed by Solaris System Administration I and II, Network Administration I and II, and Script Writing for Solaris Administrators.

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For assistance in planning training objectives and certification requirements, contact Dow Jones Training Services by phone at 609-520-5111 or via e-mail at djtrain@cor.dowjones.com. Course descriptions and schedules are available on the Web at <http://www.dowjones.com/training>.

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The company takes the word "custom" quite seriously. Whatever the client's need, Haverford delivers, from product development to service repairs. To meet customer needs, Haverford Systems recently introduced Plasmavision™, a flat data display, ideal for boardroom installations. Haverford also invented and manufactures HavaVision™, a huge projection vehicle featuring two 8' x 6' screens and a 600-watt sound system for organization-wide events and tradeshow. Sales representative Margaret Richards also recalls one of Haverford's service managers working throughout the night, from 10 p.m. to lunchtime the next day in order to finish repairs and deliver a product back to the customer as early as possible.

Andrew Stone of The McClure Group in Pennsylvania comments on work Haverford provided. The installation crew was "very knowledgeable and courteous in working with us to set up the equipment to meet our specific needs. The installation was clean and they even went so far as to make boxes to hide the cables when not in use. They definitely exceeded our expectations."

William Hunter of Harford County Public Schools adds his thoughts about how Haverford Systems helped their high school science facilities go

"high-tech." "I personally found Haverford Systems a very friendly and responsive company...I could not have been any more pleased."

Comments Richards, "Whatever the meeting or presentation, we know that 'the show must go on' and we do whatever we can to support that."

Haverford Systems provides sales, rentals, repairs, demos, leasing, and service. Computer and video projection systems include InFocus, Proxima, Sony, Philips, ASK, Lightware, Toshiba, Sarif, Electrohome, Polaroid, JVC, and 3M. To better serve its customers, Haverford maintains eight offices nationwide. Haverford also offers multimedia components, TVs and VCRs, audio and microphone systems, electronic white boards and poster printers.

Haverford Systems, ADDRESS, 800-486-5276. Fax: 610-518-2201. Web Site: <http://www.haverford.com> E-mail: margaret.richards@Haverford.com

Integrated Computer Management

This past spring Integrated Computer Management completed the first phase of a project for Ernst & Young. In just less than six months ICM designed and rolled out a 3,500-desktop document management system that allows the Big Six accounting firm to share millions of documents through its 93 U.S. locations. When complete the system will be the world's largest NT-based document management and imaging system,

and will save Ernst & Young millions of dollars annually.

ICM was responsible for system design, development, implementation, and training and acted as the prime contractor, managing a team of 30 consultants. In order to complete the work in less than six months, ICM utilized its Integrated Solutions Framework (ISF), a rapid development methodology that focuses on return-on-investment and high-performance teams to deliver solutions in compressed time frames.

In May Microsoft President and CEO Bill Gates presented ICM with the 1997 Best Business Solution Award at the company's Fusion '97 Symposium in Orlando. This award singled out ICM as a business solution leader from an international field of Microsoft Solution Providers.

Says ICM President Michael J. Luciola: "The Framework is a foundational process which provides a structured approach to quickly identify client objectives and technical requirements, enabling rapid design and deployment. It helps our staff and clients like Ernst & Young move through change like a well-practiced team, saving time, avoiding costly business disruption, and providing a more immediate impact on the client's bottom line."

For 10 years, ICM has been providing world-class business and education solutions to major corporations by introducing technology that changes the way they do business. "It's about leveraging the best technology for a business' competitive advantage."

Continued on page 18

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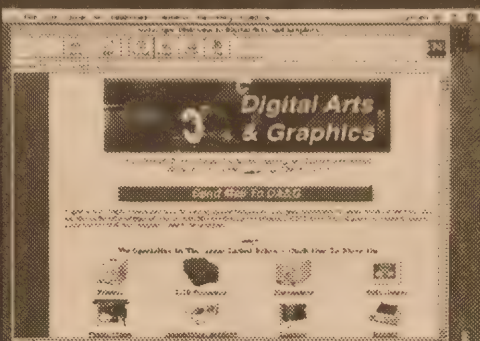
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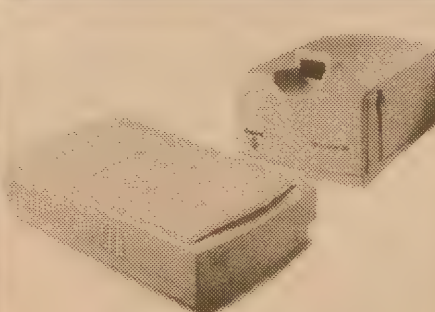
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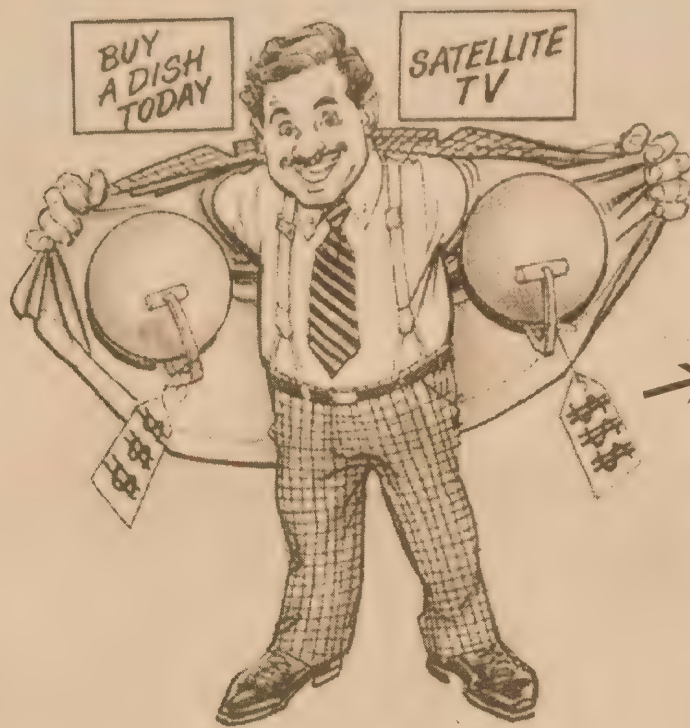


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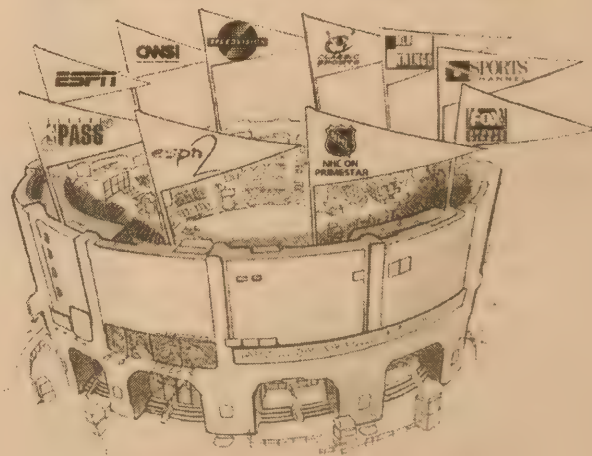
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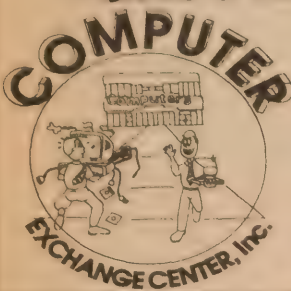
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Continued from page 12

cial value when two parties need to look at one document. If a customer is looking for answers on a company Web page and has additional questions, the customer could click on a button to talk to customer service agents rather than having to pick up the telephone and dial an 800 number.

The obvious use for Internet telephones, of course, is for lengthy inexpensive (virtually free) calls. "Most of the traffic that goes on now is traffic that wouldn't exist if not for the price structure of the Internet," says Voxware's Michael Goldstein. "I enjoy getting on one of our servers and talking to someone in Russia or China. Or a boy friend and girl friend in college will talk regularly over the system. In that sense it is like ham radio."

Internet telephony firms such as Voxware consider these value-added uses when they bank on extrapolated statistics. They quote International Data Corporation research showing that Internet telephony revenues, at \$3.5 million in 1995, will go to \$560 million in 1999, with 16 million people finding that such applications as voice messaging and interactive voice

response systems have become mandatory business tools. Another study, from the Personal Communications Industry Association, claims that telephony service revenues will rise to a lofty \$9 billion by 2005.

Still, though everyone likes to gape open-mouthed at the circus elephant rehearsals, very real questions remain.

Right now, Internet phones are truly troublesome to install. If you ever had trouble setting up your computer, don't even think about a do-it-yourself phone installation. Aficionados try to make it sound easy, but Voxware's home page offers no less than 27 pages of FAQ's and trouble-shooting advice for its Internet telephone. (Fairness requires noting that some of these tips are for last year's version and some are for the Really Dense, such as "Be sure you are logged onto the Internet.")

Phone calls are certainly easier to make over "regular" phones. Voxware and its fellow Internet telephony firms are in a tough position, says Steven Messer, CEO of LinkShare Corporation and a consultant with Columbia University's Institute for TeleInformation.

"They have to compete with a public switch telephone network

that has a tremendous reach."

You also have to wonder if the glowing statistics account for billions of dollars in Internet infrastructure needed to accommodate all these users. If the inventors are getting excited about the fabulous gadgets they can create, the telephone companies are saying, wait a minute, the line capacity isn't here yet.

"Today's Internet is as unable to support worldwide telephone service as today's telephone system is unable to support a worldwide Internet with 100s of millions of people staying connected for hours," warns Michael Dertouzos, head of MIT's Laboratory for Computer Science, in his book "What Will Be" (U.S. 1, March 19).

"You get excited about the voice over the net but only in the context of the 'Net having the capacity to handle all of it," said MCI's Vincent Cerf at the Pulitzer.com industry conference. "We need ubiquity everywhere. To work, it's got to be on all the time. You don't want to have to boot up Windows 95 to make a phone call."

When you consider that Internet phones can now be compared to cellular phones, with delays in transmission of up to 1/2 second, you can conclude that the needed capacity is a long way off.

"Accept the argument that the Internet has to get a lot bigger, but somebody has to invest in it to make it that big," says Cerf. Whether it's the telephone companies, or the government, or the Internet service providers who pay for it, someone has to pay for the infrastructure. "It's not going to happen because the numbers say it will happen, it will only happen because somebody makes the investment."

Another question is whether consumer use of the Internet will continue to grow exponentially if the price structure changes. Phone companies are talking about fighting back by offering their own Internet telephony and other services. MCI and Intel, for instance, have said they want to offer business telephony and video services for \$1,500 to \$2,500 a month. Another possibility is that phone companies will quit charging on a per-call basis and start charging a monthly fee based on service quality.

"For quality to improve, the pricing is going to have to change somewhat," says Michael Goldstein. "For networks to deliver more consistent quality they will have to figure out how to charge for it."

Goldstein warns against fingering the Internet community with the cost of upgrading phone network access. "That issue exists totally independent of Internet telephony," he says. "If people are browsing the Net from home, they're keeping their phone lines busy much longer than the telephone network designers expected. Clearly, this is costing the phone companies more than they're getting from a typical flat-rate residential tariff."

Goldstein says the solution is not to force consumers to pay more for what is fundamentally "an inefficient technology for network access. Instead, the phone company should be deploying low-cost access technologies on a wide scale. You can argue that the phone companies have had a chance to solve it for many years, through ISDN, and basically did a bad job and are paying the consequences."

Still, if the Internet telephony community can't solve the problems of installation, infrastructure, and pricing, the dancing elephants could turn into white elephants.

— Barbara Fox

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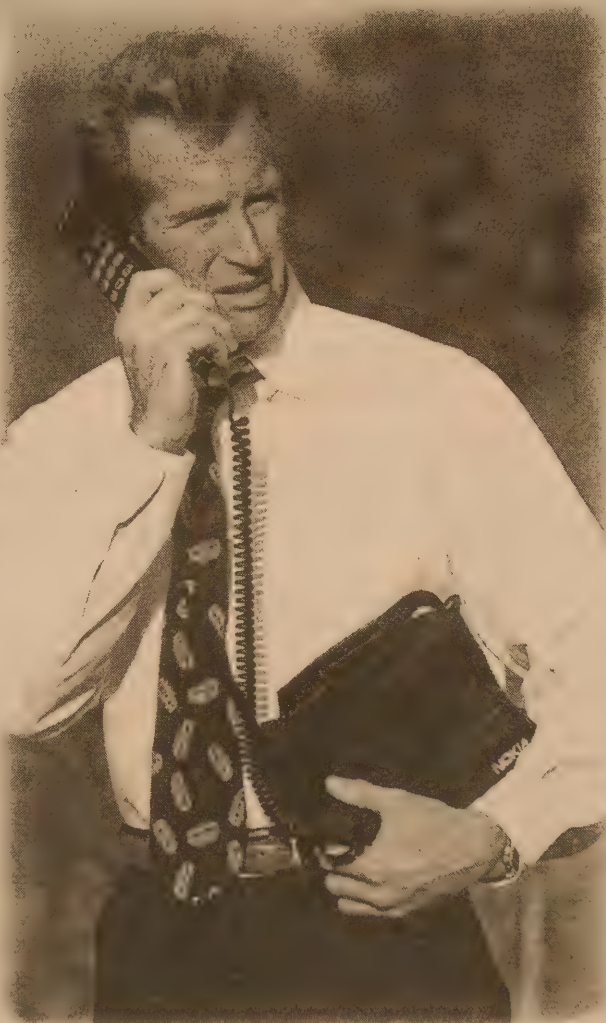
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Continued from page 12

censed to UOL Publishing and the Interactive Factory (makers of Chalk, an interactive online education program that lets professors and students talk with each other over the 'Net and share web-based information). Voxware's speech compression codes, such as RT24 and RT29, are used by other conferencing software, including Netscape CoolTalk and Netscape Conference. White Pine Software's Enhanced CU-SeeMe videoconferencing product uses Voxware's RT24 codec for low bandwidth connections.

Two of Voxware's earlier products, the Web authoring tool and the Internet telephone, received June reviews that provoked general rejoicing on College Road. ToolVox was judged to be one of the 33 Best Plug-Ins by Internet Magazine, and the Internet phone TeleVox (soon to get a new moniker) reaped PC World's Best Buy stamp.

"It consistently gave me the best sound," wrote the PC World reviewer. "My words were rarely clipped, speech wasn't garbled, and there was little echo and minimal delay. When I set up teleconferences with my relatives, TeleVox proved the hands-down choice (up to five people can join in)."

This Internet telephone lets you talk to anyone with a phone that meets the H.323-based standards; that includes Microsoft NetMeeting, Netscape Conference, and Intel Video Phone. If you have the minimum requirements listed above for VoxChat, set up your computer with the telephone software. A directory is online users is available with the program. Choose a name, and the software makes the call — and you pay no long distance charges.

An Internet Magazine reviewer called the authoring tool, ToolVox, "the best audio compression available with the truest voice playback. Sure I could use a voice and music player like RealAudio, but ToolVox lets me integrate MIDI music which keeps bandwidth rock bottom."

ToolVox's audio streaming solution, wrote Internet Magazine, is "still one of the must-have plug-ins for getting low-bandwidth, real-time audio

over a Web site. Like EchoSpeech, Toolvox uses compression to deliver audio across the Internet fast. Despite the heavy compression, voices retain their original distinctive qualities."

Yet another potentially lucrative market is the Internet gaming industry, worth an estimated \$1.6 billion in 2001. The voice-changing application business, with MetaVoice changing human voices to cartoon characters and back again, is one that Voxware had originally targeted and could still be pursued in a major way. "A future release of the voice conferencing product, VoxChat, will have the voice changing technology built into it," says Goldstein. "Fantasy and role playing is a big part of what people do on the Internet. If you're a teenage girl today on a text chat, and you want to play the role of a male, you can assume a pseudonym that is male sounding, and you are whomever you want to be. Normally, voice communications doesn't give you that freedom."

A year ago, when it had its IPO, Voxware had 15 customers. Today more than 70 have licensed its technology, including Netscape, Microsoft, Intel, and IBM. It has 14 commissioned salespeople on its territory-based sales support team and has sales offices in Japan and England. Rob Martin of Friedman Billings Ramsey & Company says that Voxware should go from red to black early next year and that its stock would then be up to \$13.

Voxware's current and future success is keyed to being able to turn on the proverbial dime. Its most recent direction change came just after Bill Gates did an about face and put his blessing on the Internet, and just before it went public. "A year ago we were aiming at the multimedia marketplace," says Goldstein. "We saw the opportunity for our technology within the Internet space, shifted gears, and developed tools within a very short space of time. These tools have already been licensed by the major big-name players in the field." Says Goldstein with justifiable pride: "No other company has quite this record." ■

People of Voxware



Picturing Voices: Voxware founder Aguilar, now vice president for R&D, applied his musical aptitude to voice compression.

At the time he started Voxware **J. Gerard Aguilar** was an amateur musician who had earned his bachelor's and master's degrees in electrical engineering from the Florida Institute of Technology. To write voice compression codes, or algorithms, he used his musical knowledge to dissect the sounds that people actually make and what goes into them: pitch, volume, articulation, timbre, and resonance. Then he figured out what redundancies these factors had and devised some parameters to "picture" the voices without including other distracting noises. The resulting algorithms form the core technology of Voxware, where Aguilar is now senior

vice president of research and development.

Aguilar shared his research with his brother-in-law, **Jordan S. Davis**, an investment banker with degrees from the State University of New York at Binghamton, the Kellogg Graduate School of Management at Northwestern, and the London School of Economics. Aguilar was then working from a small office above his father's liquor store on Chicago's South Side.

Davis introduced him to **Kenny Traub**, an Emory graduate (Class of 1983) who

was then vice president of Trans-Resources, a diversified multinational company. He had also been president of an investment company, Conservation Securities Corporation. "The more I listened to the technology," Traub has said, "the more I realized it would be more fun for him and more profitable for all of us if we built a company around his technology. Aguilar and Traub incorporated the firm in August, 1993, and Traub is now

Continued on page 20

Impact Images maintains cutting edge digital color technology to help clients produce stunning color graphics and it guarantees same day deadlines; Le Camera stocks thousands of cameras and lenses. The computer department is growing daily and includes digital cameras, scanners, and printers.

Continued from page 12

notes Jeff Bryson, Senior Vice President, ICM Education Services.

Bryson cites the new Cisco Certified course curriculum announced last month as yet another example of ICM using technology to help clients serve their people and their market better. "Cisco Systems, the leading global provider of internetworking solutions for corporate Intranets and the global Internet, fits perfectly in with our ever-expanding range of disciplines." ICM will begin to offer Cisco Certified courses in Princeton and Roseland through its New Jersey-exclusive partnership with Ascolta Training Company of Irvine, California. Ascolta, a Cisco Certified Training Partner (CCTP), will approve all curriculum and training materials used at ICM Education Centers.

"Clients are also looking to benchmark and assess skills before and following training in order to measure the success of the programs they've contracted," points out Bryson. Understanding the factors that influence clients, ICM continues to provide traditional and alternative education and business methods ideal to meet a variety of business needs.

By being flexible the company has been able to change with the industry and client needs. That flexibility is at the core of the company's success and influenced the company's growth and success. In just its third year in

the Princeton Area, ICM is ready yet again for another expansion which will enable the company to continue to meet client needs and demand.

ICM, headquartered in Roseland, provides technology-driven business solutions, enterprise network design, and consulting and related education services.

Integrated Computer Management, 280 Corporate Center, 5 Becker Farm Road, Roseland, 201-535-3400. Fax: 201-535.8789. Web Site: <http://www.icmsolutions.com> 600 Alexander Road, Princeton, Phone 609-987-0140

Impact Images

When asked to define Impact Images, account manager Cheryl Brown qualifies the company as "committed to providing color on-demand digital printing. Our customers depend on us to work as their right hand to produce their booklets, manuals, posters and presentations from their files, slides, or photos, on time and in full-color."

In spite of the number of digital printing services in the area, very few can guarantee same-day deadlines. By doing just that, Impact Images has earned a reputation for working miracles for their clients.

Brown recalls a pharmaceutical client who had sent their trade show exhibits in advance of their own overseas travel. Caught in customs, there

was no guarantee it would be released in time for the show, so the client needed the graphics redone in one day. They turned to Impact Images. "When you come through for your clients in the toughest of circumstances, you earn their respect, future business, and referrals," says Brown. It's service like that that has enabled Impact Images to grow successfully over the last five years.

Impact Images maintains cutting edge digital color technology to help clients, big and small, produce stunning color graphics to fit any time, project, or budget requirement.

Impact Images, Princeton Service Center, 3490 Route 1, Princeton, 609-951-9200. Fax: 609- 951-0729. Modem: 609-951-9459.

Le Camera & Computer

The proprietor of Le Camera on Quakerbridge Road in Mercerville, Phat Le, started his business seven years ago as a small mail order company for camera equipment. Within a short year, Le opened a retail store in the Park Plaza shopping mall. Today Le Camera is a major photographic retailer focusing on all types of imaging equipment from traditional SLR (single lens reflex) cameras to sophisticated digital cameras and computers.

As a business owner, Le knows the importance of customer service. Customers are made to feel welcome re-

gardless of their knowledge of cameras. "Our staff is at your disposal," says Le. Knowledge and understanding are key ingredients to satisfy customers. "A satisfied customer is one who receives the information needed in order to purchase the proper equipment."

Le also recognizes that not everyone knows the correct questions to ask. His sales staff are trained professionals and know how to help customers determine and understand their needs. With expertise, information, understanding of the products and the customers' needs, the staff at Le Camera ensure that the customer will leave with the correct equipment for the job...not necessarily the most expensive.

Service alone is not enough. You must have the product. Le Camera stocks thousands (and this is not a typo) of cameras and lenses. The computer department is growing daily and includes such items as digital cameras, scanners, output devices and printers. They also service, repair, install, and build Macs and PCs.

"The bottom line is this," says Le, "if you purchase an item that cannot do what you need, you've wasted your money." Le Camera focuses on customers' needs and their satisfaction. Le believes these are the building blocks for continued success. With the

Continued on page 20

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Continued from page 18

executive vice president, chief financial officer, and secretary.

Traub had met **Michael Goldstein** at Harvard, where they had both earned their MBAs. The son of one of the first systems engineers at Bell Labs in the early '50s, Goldstein carried his childhood experience with "tech speak" on into a technical consulting career. After Brown (Class of 1975), he had helped pioneer some of the earliest multimedia technologies of telecommunications technologies in the late '70s and early '80s. Then he was vice president of Macmillan Software and put in seven years at McKinsey & Company. He was just about to accept an offer to be chief technology officer at a major advertising firm when Traub and Aguilar invited him to come to Princeton as Voxware's president and chief executive officer. He is married to June Ballinger, an actress who is now artistic director of Passage Theater in Trenton, and they have a 10-year-old son.

Together, Goldstein and Traub recruited **Steven Ott**, now vice president of global sales, and **Ken Whittington**, now vice president of business development.

Ott came in October 1994 from Legent Corporation, a systems management software company, where he was vice president of corporate development. In the late '80s he had also been district sales manager for Business Software Technology, a developer of systems management software. Whittington arrived in August 1995. He had been director of desktop products at Symantec Corporation and development manager at Central Point Division.

Voxware's finances are handled by **Nick Narlis**, who began at Vox-

ware in 1996 and is now vice president, chief accounting officer, and treasurer. A graduate of Rider (Class of 1982) and a CPA, Narlis had been a senior manager at KPMG Peat Marwick in the New Jersey Audit Practice Unit and director of finance at Dendrite International Inc.

Just before Voxware went public in July, 1996, **William J. Geary**, a principal with North Bridge Venture Partners and a general partner of Hambro International Equity Partners, went onto the board of directors. Geary, a CPA, went to Boston College. Everyone else on the board has been around for at least 18 months — a long time in the life of an Internet company. **Andrew Fillat**, who came to the board in December, 1995, is senior vice president at Advent International, former vice president of technology at Fidelity Investments, and has degrees from MIT and an MBA from Harvard.

When **Richard M. Schell** joined the board in August, 1995, he brought a valuable connection with Netscape, where he is senior vice president of product development. He has undergraduate and graduate degrees from the University of Illinois. **David J. Roux** joined in March 1994 and is executive vice president in charge of business development at Oracle Corporation; he has degrees from Harvard and Cambridge.

The board is completed by Aguilar, Goldstein, Traub, and Davis. Voxware had had a scientific advisory board, but it has been disbanded.

With a strong group of PhDs from a number of different sub areas in speech, Voxware claims to have the deepest voice compression and voice modeling laboratory in the country. The team is led

Middleman: Kenny Traub was the man who brought Michael Goldstein into the Voxware picture.

by **Juin-Hwey (Raymond) Chen**, senior director of research. Chen came to Voxware in October, 1996, from AT&T Bell Labs and AT&T Labs, and has invented such speech codecs as the international standard ITU-T G.728; he has six United States patents and about a dozen others pending. He went to National Taiwan University (Class of 1980) and has graduate degrees from the University of California at Santa Barbara.

Robert McAulay, senior scientist, is also working on innovative speech coding. McAulay had spent 20 years at the MIT Lincoln Laboratory and has four patents based on sinusoidal coding; he did his undergraduate work at the University of Toronto (Class of 1962) and

With a strong group of PhDs, Voxware claims to have the deepest voice compression and voice modeling laboratory in the country.

has graduate degrees from the University of Illinois and the University of California and has published more than 50 papers.

Kevin Erler heads voice modeling research — voice conver-



sion, text synchronization (like karaoke and "watching the bouncing ball") and lip synchronization. This previously unemphasized technology automatically "synchs up" lip movement to sound. It extracts phonemes from a speech track and attributes lip movements to them — a process now done by hand in animation houses. Erler went to the University of Alberta (Class of 1987) and did his graduate work at the University of Waterloo, then worked at NorTel and Bell Northern Research.

Craig Watkins, senior research engineer, is concentrating on speech and audio (music) coding R&D activities. A graduate of the University of Queensland (Class of 1990) he has a PhD from Australian National University. He had worked on low-rate speech coding at Motorola Corporate Research Laboratories and did speech coding (involving frame erasure concealment for G.728) at AT&T Bell Laboratories.

Marketing had been a Voxware weakness, and until **Joan Spindel** was hired last fall, the firm had no marketing vice president. She grew up in Scarsdale, where her father had worked for IBM, and went to Hamilton College, Class of 1984. She held marketing positions with Prime Computer, EMC Corporation, and most recently for Lotus, and she has been successful in her efforts to raise Voxware's media profile.

Also hired last fall, **Bathsheba J. Malsheen** is chief operating officer, and all the vice presidents except Aguilar report to her. "I am responsible for global sales, marketing, product management, marketing communications, finance, and investor relations," she says. "I am responsible for profit and loss of the company."

A gregarious, vivacious person, with a take-charge attitude and

Continued on page 22

With 750 computers available, Mercer College's Center for Training and Development is one of largest providers of computer training in the area; Originally a paging company, The Phone Zone has transitioned over the years into a total phone solution business, from pagers to cellular phones. Because PrimeStar offers the satellite dish as part of its service, customers never get stuck with out-of-date technology.

Continued from page 18

need for additional retail space, Le Camera will be relocating to Route 1 in Lawrenceville this fall.

Le Camera, 4040 Quakerbridge Road, Mercerville, 609-588-9090. Fax: 609-588-4843.

Mercer College

The Center for Training and Development at Mercer County Community College

When area businesses, non-profit and government agencies are looking for organizations to provide training to their employees, there are a number of training centers and programs in the area from which to choose. "But if they're looking for an organization whose business is education, an organization which has the strength and flexibility to offer broad-based customized and open-enrollment training, the only choice is the Center for Training and Development at Mercer Community College," says Center director, Nunzio Cernero.

The Center provides computer, management, support staff, and technical training to employers in the Mercer County area. Customized contract training and open-enrollment courses are geared to meet business goals and employee needs. "Our customized contract training allows us to tailor the program to the client's needs, class size, focus, and level. In addition, our open-enrollment non-credit

training provides regularly scheduled training, particularly on popular business applications and skills, ideal for the individual professional student."

Contract training is an innovative example of how Mercer County Community College is meeting business needs. "We meet with the employer, identify the company's specific needs and translate that into a training program offered on-site or using the College's facilities." For computer training, for example, the College has 750 computers available between its two campuses for day-long and evening instruction.

The Center for Training and Development is one of largest providers of computer training in the area. "Information and technology are constantly changing and for businesses to succeed, their employees must have current knowledge and skills, whether the focus is on the latest management trend, such as Total Quality Management, or on popular computer programs, applications, and systems such as Windows NT. Our computer training program, for example, has in its ten years taught more than 35,000 students, many from area businesses. Last year alone, more than 62 businesses and organizations turned to The Center for Training and Development. Those students bring the strength of their education from the classroom back into the boardroom."

To succeed in today's market businesses must remain competitive. That means having the best resources available. "A business' staff is its pri-

mary resource. A skilled, capable staff gives companies that competitive edge," says Mercer helps area businesses get and maintain that edge.

The Center for Training and Development at Mercer County Community College, PO Box B, Trenton, 609-587. Fax: 609-890-6338 Web Site: <http://www.mccc.edu> E-mail: ctd@mccc.edu

The Phone Zone

She had just been in a car accident and needed help fast. She might have had to wait for help to arrive but there was no time to waste. Someone was critically injured. She reached into her purse and used her cellular phone to get help. She saved a life.

Joe Michaels, founder and president of The Phone Zone in Skillman knows a number of unbelievable stories where a cell phone saved a life. "They offer much more than professional convenience. They offer the freedom of communication no matter where you are, no matter what you need. And in recent years, the cost of cellular phones and calling plans have changed drastically, making them more affordable and making you and the people you need to reach more accessible."

Such changes come quickly in the telecommunications industry. No one knows that better than Michaels. The Phone Zone, which recently opened a location in Skillman, was originally a paging company and has transitioned

over the years into a total phone solution business, from pagers to cellular phones.

Whether you're considering getting your first cell phone or your current contract is ending, come to The Phone Zone for quality AT&T products, programs, and services. With a broad selection of products, programs, and services, you're bound to find what just what you need.

The Phone Zone guarantees 100% satisfaction. If you're not completely satisfied, The Phone Zone offers you your money back or product exchange no matter what your reason.

The Phone Zone, Montgomery Shopping Center, 1325 Route 206, Skillman, 609-497-0333. Fax: 609-497-1181.

PrimeStar

Think you know everything about satellite TV? Think again. "Many people think that satellite television is expensive and that you must purchase a satellite dish," points out Gemini Lake of MBD PrimeStar in Cranford. "That's true for some satellite services, but not ours."

While satellite dishes can cost up to \$400 for a mini-dish and nearly \$250 installation, you could spend \$900 before you even get started. Or you can start with MBD PrimeStar.

MBD PrimeStar is one of only a few satellite television services that offers a complimentary satellite dish for its

Continued on page 22

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Continued from page 20

ongenial style, Malsheen seems suited for Voxware in every way. Early in her career, she did groundbreaking work in analyzing women's and children's speech, and now — for her commuter marriage — she is an inveterate user of internet telephony.

Her husband, Keith Williams, is a research engineer at SRI in California, and she says their bicoastal living arrangement is "kind of fun. We love New York City and we love San Francisco, and if you can get away without making a choice, why not?" One of Voxware's products, the Internet telephone, helps make this marriage work. They use it to talk four times a day. "I ring his computer and we speak; it keeps the phone bill down."

Malsheen holds several key patents for software engineering and has earned her technical stripes in "text to speech" technology research. "I was always interested in the structure of language and universal characteristics of language," she says. She grew up in Clifton, where her mother was a legal secretary, and majored in Spanish at Hofstra, Class of 1971. At Brown, where she went for her master's degree in linguistics, she took courses in phonetics and became interested in acoustic aspects

of speech. She has her doctor's degree in speech engineering from Brown.

"Then at MIT I began to do speech research from an engineering perspective," says Malsheen. Her pioneer work at MIT's Research Lab of Electronics was in analyzing and synthesizing women's and children's conversational speech.

From MIT Malsheen went to Speech Plus Inc., where she was director of speech technology. "I just thought there were more opportunities to be creative and be involved in new product development," she says of her departure from academe. "Up until the early '80s good software tools were not available to analyze speech. Speech tends to be very CPU intensive. Until PCs became powerful enough to run speech applications, speech technology had to be run on very expensive specialized hardware."

Most recently she worked at a San Jose-based voice messaging company, Centigram Communications Corporation, where she was general manager of the Technology Business Unit and was responsible for licensing text-to-speech software products.

"The difference between being

Marketing Maven:
Joan Spindel, most recently with Lotus, is trying to raise Voxware's national profile.

the general manager of a smaller division in a similar business and COO of Voxware is that there I had engineering. Here the focus is a bit more on revenues and budget, P&L, and I am not as involved in the day to day engineering."

Though Malsheen is one of the few top-level female executives in the Internet community, being in the minority has never been a problem. "I'm in technology — every company I've come into has been male dominated," says Malsheen. "I never ever wanted a traditional life. I didn't want to have kids; I wanted to work. There weren't that many women who wanted that career path, and I have been blessed with singlemindedness."

Asked what she brings to the job, Malsheen admits to being a good manager: "I like people to be aware of everything going on in the business — I don't like to isolate any group, I want them to see the big picture. I also like to do trend



and data analysis. My social science and humanities background allows me to look at historical data as well as the current market and present that in a way that gives people a better understanding of the overall speech market."

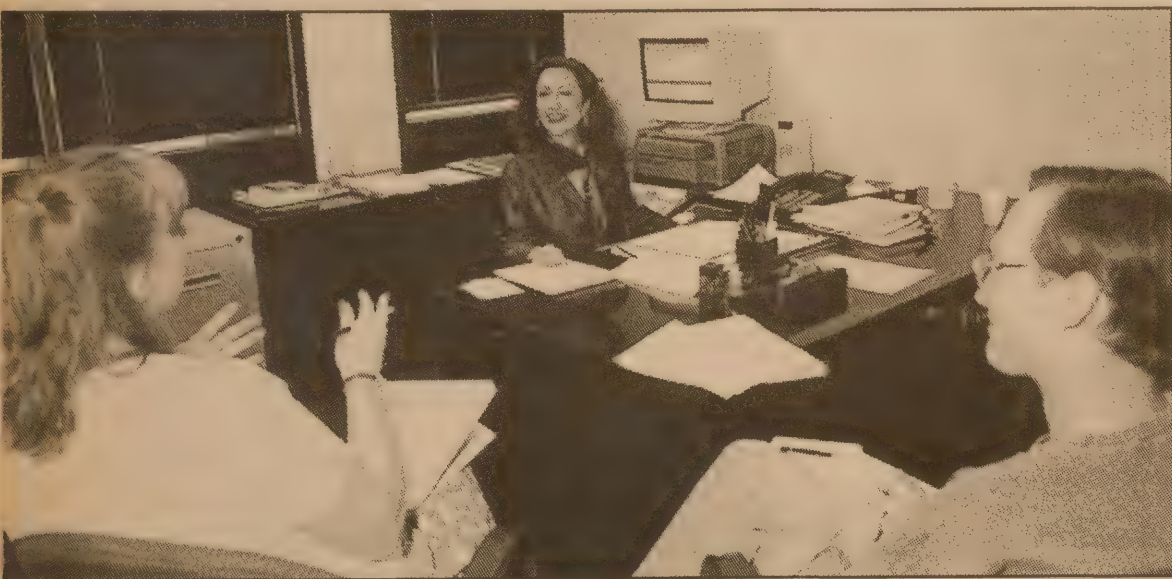
Malsheen's career mirrored the progress of speech technology: "Over time the speech market has evolved from an exclusively hard-

ware model to a software model. Now there are opportunities for speech in both hardware to software." So even as Voxware concentrates on growth in talking Web pages and Internet talk radio, it might also be licensing its voice magic to what you can hold in your hand — personal digital assistants, calendars, and teddy bears.

Still, she says that Voxware's primary challenge is to convince the public that voice on the Internet will work. "Our major market is voice over IP for Internet applications, but I think that people are just starting to use voice over the Internet. Voice is such a natural addition to Web pages and IP applications, but we have had to do some evangelizing to convince people that we have the technology, and that it works today."

— Barbara Fox

Bucks Stop Here:
Bathsheba Malsheen, the chief operating officer, is in charge of making the company profitable. And she uses Voxware software to chat with her West Coast husband.



A computer network eliminates duplicated efforts and speeds communication, says Jonathan Sneedse of Princeton Computer Support; Moreover, bringing a network online is one of the most cost-effective ways to provide the business resources of the Internet.

Continued from page 20

customers. What does that mean for you? "Because satellite technology is constantly changing, you don't want to be stuck with out-of-date technology," comments Lake. "Because we offer the satellite dish as part of our service, you never get stuck with an old model. We upgrade our equipment for our customers at no charge as soon as new technology comes to market."

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You also get more channels. While cable television generally offers up to 30 channels, satellite TV can offer up to 160, but for little more than the price of premium cable services. MBD PrimeStar offers, for example, 94 channels for just \$34.95 each month.

"But there's one thing that you don't get with satellite television that you do with cable—major down time. Cable television services are often out of service several days each year. We average no more than six hours for the entire year — if we have any."

Satellite television is about choices and about getting more for your money.

MBD PrimeStar, 6 Commerce Drive, Suite 2000, Cranford, 908-276-5777. Fax: 908-272-6297.

Princeton Computer Support

It's not a question of keeping up with the Jones' or having the latest technology just because your competitors do. It is, however, a question of just how efficiently your business runs. An efficient business is more likely to be a profitable business. But some businesses still haven't gone on a network.

Without a network, businesses rely on individual stand-alone computers. "The problem," notes Jonathan Sneedse, vice president of sales at Princeton Computer Support, "is that without a network there is no efficient, direct line of communication among system users. Without that you risk duplication of effort and therefore a significant waste of time and resources." With employees using the same software on standalone units, each computer is then overloaded with software which ultimately slows the hard drive down, as well as one's efforts. A computer network eliminates duplicated or conflicting efforts and information and speeds work and communication.

If that's not enough of an incentive to network your organization, consider that with the improvements in technology over recent years, networking has become more affordable and easier to install and use. File servers are no longer so mammoth that they need their own room to run. Notes

Sneedse, "Servers can even be stored safely and out-of-sight in a utility closet. It's as simple as that."

Princeton Computer Support provides expert network installation. Sneedse recommends that businesses have a dedicated file server that maintains all the company software and applications. Clients like ICI Commercial Finishes, which relies on a number of tasks carried out by various departments in order to successfully complete a project, benefits significantly from networking. "Everyone needs access to the information," notes Sneedse, "from the individual who markets and specs the job, to the individual who schedules the job and orders the materials. Without a network it would be chaos."

Princeton Computer Support also helps businesses bring their network online, whether for internal or external needs, from posting sales information and live pricing from distributors, to offering technical support, such as online manuals and white papers.

"As valuable as the Internet is, it is amazingly easy and affordable to go online," says Sneedse. Princeton Computer Support can work with you to find a local Internet service provider (ISP), obtain a company account, as well as purchase gateway or proxy software which allows employees to use a single account for one low cost. "Without a network, a business wouldn't be able to go online without

obtaining individual accounts, which are exponentially expensive and cumbersome to install and maintain."

Says Sneedse, "Bringing a network online is one of the most cost-effective ways to provide a much needed business resource to employees and customers. Costs are limited to the company's ISP account and the purchase of a gateway or proxy software. A business' network can be up and running online in just a few hours." Princeton Computer Support has helped a number of area businesses go online and make their local network a part of the Web, including schools, museums, libraries, hospitals, and businesses.

Princeton Computer Support, 5 Crescent Avenue, PO Box 787, Rocky Hill, 609-921-8889 or 800-682-5168. Fax: 609-921-7691. E-mail: pcsisales@pcsi-usa.com Web site: <http://www.pcsi-usa.com>

Princeton Internet Group

One of the key focuses today in the computer and Internet industry is "object technology." Object technology promises to change the way we do business as much as the Internet has over the past few years.

"Object technology is a more efficient way to create personalized, dynamic, interactive applications for Web

Continued on page 24

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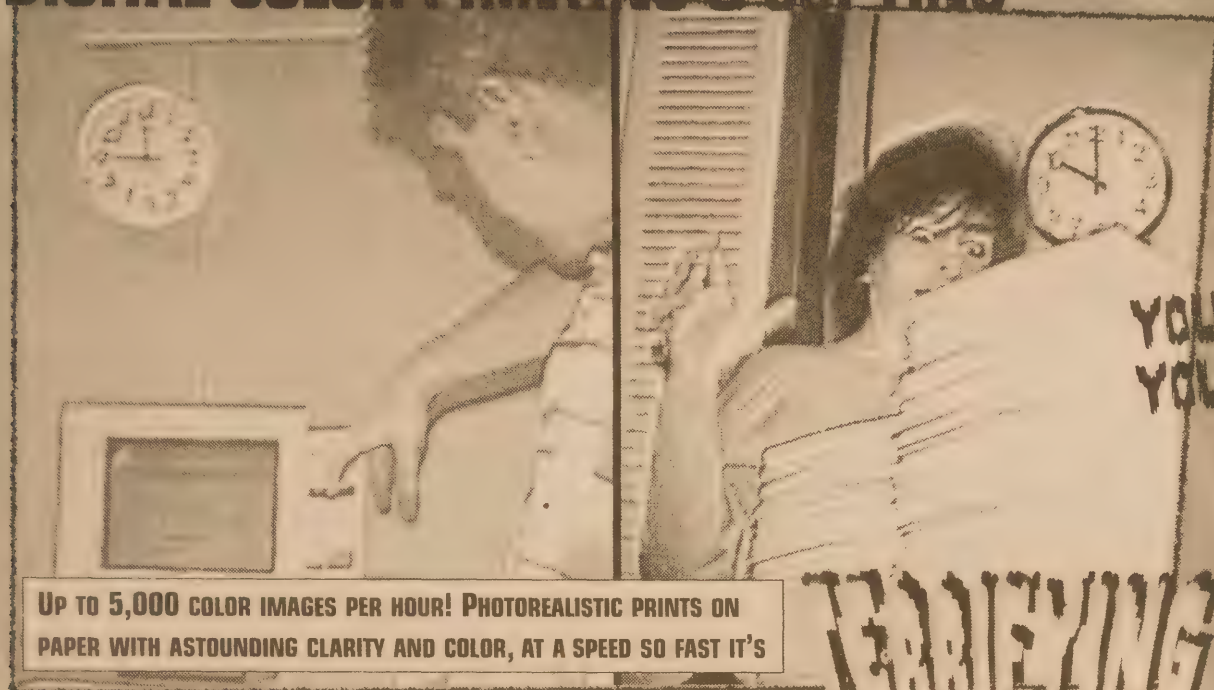
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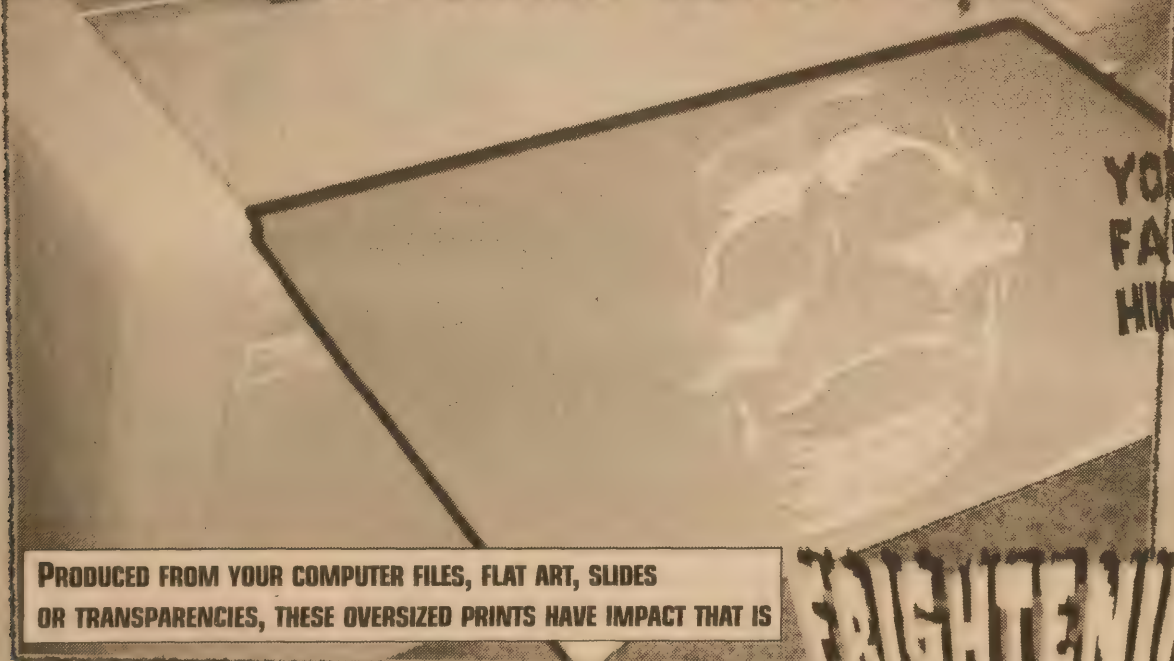
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**PlnG is using object technology to create dynamic, interactive Internet applications;
Snelling Personnel maintains information technology recruiting departments.**

Continued from page 22

sites, intranets and extranets, and other desktop applications," comments Craig Miller, who recently joined PlnG as a software engineer.

Adds Miller, "With object oriented programming and technology we have a new method for establishing entities on computers. Rather than writing procedures and creating data structures independently, we can combine them in a way that more closely resembles the way we think.

"Object technology works with the way our minds do, on an intuitive level that combines or separates ideas logically." And perhaps the greatest advantage of object technology is that it can facilitate work in different delivery and storage formats. "As a company's business logic changes, object technology allows them to manipulate, work with, and expand the products they have and applications they are using to meet new needs without having to completely rewrite the application. Eliminating repetitious work saves the client time and money and helps them maximize their programming investment."

The object way of looking at things applies to more than just computer code, but also to content, and how it is assembled, functions, and is personalized for the user. Object technology also allows sites

to be different things to different users. "Content and function of an application or environment can be customized for particular employees and departments or business partners, making the entire communication process more efficient. Simply put, you get the information you need in a way that is useful to you without having to maneuver through clutter that carries no importance for you."

By riding technology's cutting edge, PlnG has not just been enjoying the success of the industry but also creating a benchmark for other companies to strive for and obtain. PlnG success is about more than just technology. It's about how the company uses technology to help clients solve real business problems and meet business objectives. PlnG's success in its two years is clearly exemplified in its growth in just the past twelve months alone, with revenues increasing significantly and staff doubling to welcome the talents of Craig Miller and others yet to come.

Much of the company's recent growth can be attributed to its approach to the application of new media. "Just a few years ago, the Internet seemed like a business trend. Everyone was on it. You had to be on it. Now, businesses are stepping back and looking for value, for quantifiable results that make this media worthy of their investment," says Woody Armstrong, Project Manager.

PlnG uses the combined skillsets of its staff to carry the message of what interactive media and technology can do — for individuals setting up an online presence, start-up businesses using the medium to communicate and promote their business, and for large corporations looking to communicate their message to the

general public as well as enhance internal communications and information sharing.

Since it was founded in mid 1995, Princeton Internet Group, Inc. has serviced over 100 clients, including AT&T, Engelhard Corporation, American Home Products, Bell Atlantic Nynex, New Jersey Department of Education, Princeton University, Medical Society of New Jersey, Newhouse Publishing, and Nassau Broadcasting Company. By providing its clients services of the highest quality, PlnG has quickly established itself as one of the premier Internet service, development and consulting firms in the region.

PlnG helps its clients identify the ever-increasing opportunities for using information technology to streamline and enhance their businesses. In addition to Internet services, PlnG offers customized web, database, and intranet/extranet applications, network consulting and multimedia design.

**Princeton Internet Group,
13 Roszel Road, Princeton,
609-452-1667. Fax: 609-452-
0063. Web site: <http://www.PlnGsite.com>**

Snelling Personnel Services

Recently Snelling Personnel Services worked with a client in the disaster recovery industry to help staff an entire department, requiring information technology and finance professionals. "The client needed a mixture of staffing services. They needed to hire professionals with a broad range of skills and experience and to fill positions of varying terms of employment," notes Rob Brown, president of three Snelling Personnel Services in the tri-state area. "The cli-

Continued on page 26

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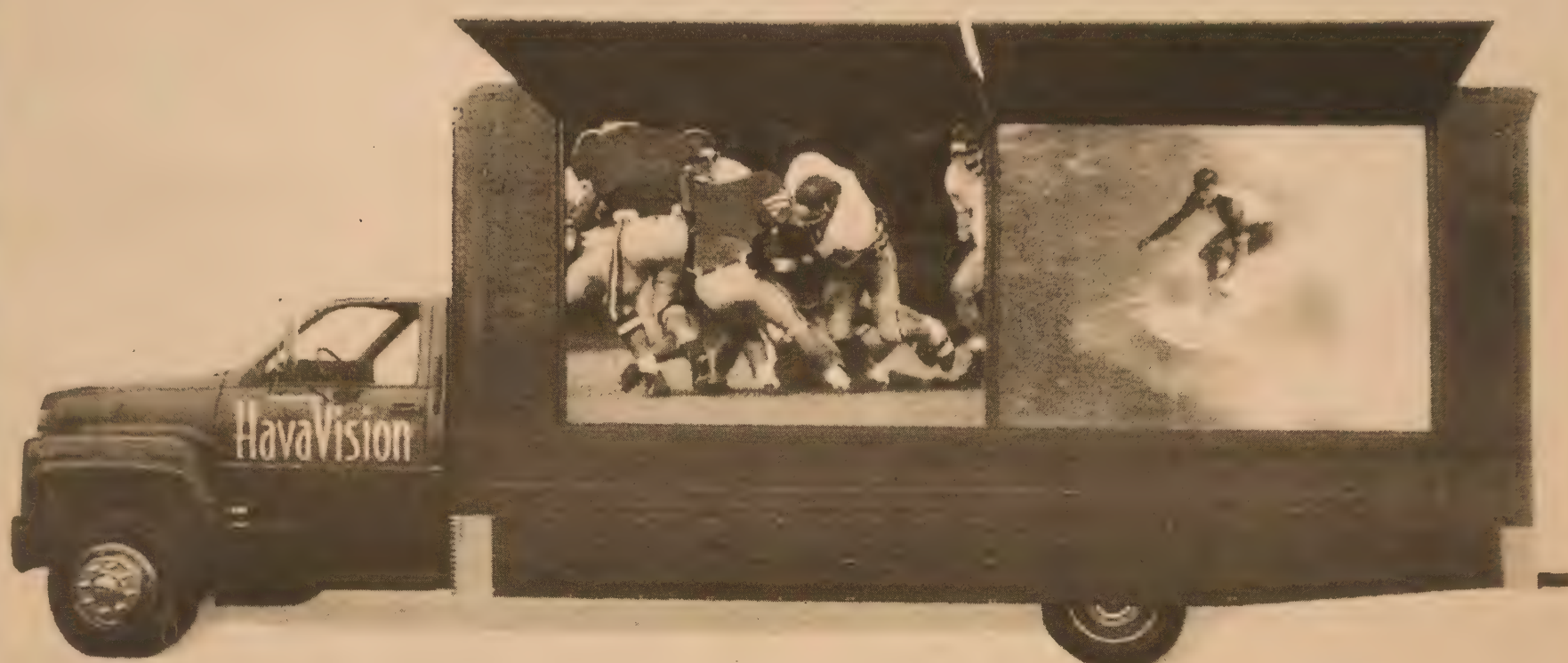
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Continued from page 24

ent was thrilled to have our firm manage the entire selection process, from recruitment and interviews to drug testing and hiring. We were able to take on responsibilities traditionally born by the client to allow them to focus on other and equally demanding aspects of their business."

Snelling also recently completed an assignment with an auto parts business headquartered in the tri-state area. "The client already managed 1,000 stores and was still growing, with 150 new franchises opening yearly." To manage such rapid growth the client needed the strength of Snelling Personnel Services to manage new hires for store openings and provide master vendor programs. "Because of the Snelling network and its 350 offices nationwide, coupled with the breadth of over 45 years of experience, the client could rely on Snelling to truly be a full-service staffing company, providing permanent, temporary, and temp-to-perm recruiting and placement."

Notes Brown: "With the Central New Jersey area so popular for high-technology and pharmaceutical corporations, the Greater Princeton Area has a particularly strong need for information technology staffing services for entry level through management permanent, contract, and temporary placement. To that end, both our Princeton and Philadelphia offices maintain information technology recruiting departments staffed by full-time information technology recruiters to meet the client demand and identify appropriate candidates for successful placement."

The guide to successful placement, counsels Brown, is matching the right candidate with the right client for a total win/win situation. "But to satisfy clients with appropriate staffing, you must be able to attract and maintain the right candidate pool and meet their individual needs in order to meet client organizational needs." Snelling Personnel Services offers candidates the support that few of their competition can with opportunities, benefits, and support.

Snelling Personnel Services provide services to candidates and clients in accounting and finance, automotive, banking, insurance, medical and healthcare, sales and marketing, office and support services, light industrial, engineering and technical, information technology, transportation and distribution, legal, hospitality and food service, human resource, retail, and telecommunications fields.

Snelling Personnel Services, 350 Alexander Road, Princeton, 609-683-4040. Fax: 609-683-5621 Web Site: <http://www.snelling.com/prince> E-mail: rdunhil@aol.com

Source EDP

It used to be that staffing companies simply placed permanent candidates in long-term programming or technical jobs or provided contract programming on a temporary basis. Today however, the industry trend is focusing on flexible staffing approaches, including staff augmentation, project management, outsourcing, and system integration.

"While we have always been strong in placing skilled technical workers, Source EDP has grown to include its new role as staffing consultant," comments Marti Murphy, Managing Director of Source EDP, a division of

Source Services Corporation, a full-service computer staffing firm in Princeton.

"The industry change has really only occurred over the last two years," notes Murphy. "The industry is driving the demand for companies like Source to act as a partner, not simply a vendor. Businesses do not want to own their employees, but they need the solutions skilled employees can provide. Companies used to hire their own employees and manage the inherent responsibilities, but so much of what happens in Information Technology is project-oriented, with a cycle from beginning to end. Maintaining long-term employees when you can't even see that far ahead simply doesn't make sense." Source EDP partners with its clients to provide the staffing they need, the way they need it.

And where traditionally the candidates who turned to a firm such as Source EDP had a specific idea of what they were looking for (temporary or permanent placement), Source has taken a new role as an employee manager. "The industry has a supply and demand problem, there just don't seem to be enough qualified Information Technology professionals for the work available," notes Murphy. So in the role of an employee manager, not only does Source offer its clients freedom from the responsibilities of "owning" its own employees, Source offers its candidates technical training, benefits, and a greater focus on their career, not simply the position they can fill. "For the candidate, that means we develop a vested interest in their careers. For the client, that means we have the staffing to meet their needs."

For some candidates, such a focus has diverted their attention away from permanent placement to consulting work, resulting in better pay and quality of work. In addition, Source offers a candidate 40 hours of training each year. "Having a company invest in your potential and skills can be the security you need in any job market."

In building its new focus on consulting, Source EDP has been restructuring in order to better handle client needs internally. That includes Source's new "tech check" which quantifies the level of technical skill to better help Source assess the match between client and candidate.

Acting on past success and managing a changing industry has helped Source land contracts with Fortune 500 companies like Bell Atlantic, General Motors, Eli Lilly, and others.

With 60 offices throughout the United States and Canada, Source EDP has an established network that leads to quick turn around. Murphy comments that the typical recruit has 3 to 15 years experience and a salary history ranging from \$35,000 to \$85,000. Nationally, the database houses approximately a million recruits. In New Jersey alone, Source EDP has a database of tens of thousands of potential candidates. "Such an extensive database provides for a greater diversity of skills and the likelihood of a better match. This refines the search for both the company and the candidate, and allows us to be highly selective in the process. In fact, when we place someone, 80% of the time it's with the first company to which we present the candidate."

With Source EDP's knowledgeable staff and personnel resources, Source EDP is able to counsel companies on refining their search, resulting in locating and hiring suitable personnel

Laser North: Hands-On Approach to Laser Cartridges

Shortly after the advent of the laser printer, it became clear to a small group of pioneers that there was an important service to be created in rebuilding spent cartridges. "It is expensive to replace toner cartridges," says Laser North's founder Gary Wilson. "And the waste of resources is unacceptable."

One of the true pioneers in the laser cartridge rebuilding business, Wilson's experience reflects the spirit of a dedicated risk taker who at one time handled explosives in building demolitions.

"When somebody asks how I got into the cartridge rebuilding business," says Wilson, "I go through a long story of how I rebuilt my first cartridge on my living room floor."

"The rebuilding process was somewhat tricky for a veteran truck mechanic, but the hardest part was trying to find a toner manufacturer with a toner which was compatible with the new technology of laser printing," Wilson continues.

"After trying many types of toners, my new business adventure didn't look good. There was no one else to turn to. I felt like I was on a wagon train, lost without a map. The only solution I was able to come up with was to call around to large companies and find enough empty cartridges with some toner left in them to collect up and build one cartridge. That is how I finally started my business. I needed about 10 empty cartridges to have enough toner to build one."

Finally, after a year of scavenging, Wilson found a toner supplier who had a toner that was compatible with laser printing. Eleven

years later, Laser North has grown from the days of rebuilding cartridges on his living room floor to a large facility.

"The industry has also changed," he says, "from a handful of rebuilders nationwide to several in every major city today. Our pioneer days set us apart from the competition. Those early days of learning what to do and what not to do helped make us an industry leader. Our cartridges have proven to be the best they can be, year after year after year."

Wilson's company has actually helped to create today's industry standards. He has worked closely over the years with the suppliers to upgrade their products, consulting with manufacturers of both the toners and the OPCs (the cartridges' photoconductive drum).

Exactly what he does is a trade secret, and will remain so. "Nobody does a rebuild exactly the way we do," says Wilson. "That's what keeps us out front. And now we offer full laser printer service and repairs, so we can bring our years of expertise to helping your business even more."

Throughout the years Wilson has literally kept his hands on the cartridge business. "I have remanufactured more than 10,000 cartridges personally from start to finish," Wilson says. "I even logged and racked each of these cartridge's performance and have concluded that remanufactured toner cartridges are an economical and environmentally sound choice versus buying new ones."

Laser North, 19-C Lexington Avenue, Ewing. 609-883-2211.

within a relatively short period of time. "When you're looking for technical hires, business can't wait. Source EDP has the resources to quickly meet computer staffing needs."

Source EDP is part of the Source Services Corporation, an international recruiting firm comprised of experienced specialists in a variety of professions, including legal, financial, engineering, and healthcare.

Source EDP, 5 Independence Way, Princeton, 609-452-7277. Fax: 609-520-1742. Web Site: www.experienceondemand.com E-mail: murphy@sourcesvc.com

Taylor Photo

You can find him in the pages of a magazine, but you'll never see his face there. You'll only see what he sees. Recently that included helicopter shots of New York City and the stunning sights of India and Nepal.

Bill Taylor's photography can be found on the pages of a magazine or on the walls of a gallery. In fact, this year Forrestal Village will be hosting "Passing Through India and Nepal, Travel Photographs by William Taylor".

"It's one of the best perks of the job," says Taylor. "Looking through the camera's eye forces me to slow down and really understand where I am and what I'm seeing." Because of his craft and his talent, Taylor gets to travel all over the world. His upcoming show at the Forrestal will highlight his travels earlier this year. And as this article

was going to press, he had just returned from a trip to Scotland.

Many Fortune 500 companies turn to Taylor Photo for the talent and quality products that Taylor and his staff have been delivering for the past 15 years. Taylor Photo offers studio, lab, traditional photography and digital imaging services to businesses in the Greater Princeton Area. Always the focus is on the customer. To meet customer needs, Taylor Photo is always finding new ways of doing things better by providing new technology and services at a lower price.

Taylor Photo recently began working with clients on web graphics preparation and design. Using their drum scanner, they are able to offer clients the sharpest, clearest image possible. Solidifying Taylor Photo's commitment to the Web, they also recently went online with their own Web site. Online you can see just what every department at Taylor Photo does, from the lab to digital imaging to the photography studio. You can also view samples from their portfolio.

Taylor Photo has long been committed to helping clients produce top quality digital images. Taylor Photo recently introduced Cibachrome print service which enables one to make prints directly from slides and color transparencies. Taylor Photo has also added a large format film recorder which allows them to create a negative or a transparency from a digital file, ideal for producing photographic

Continued on page 28

Maintaining long-term employees when you can't see that far ahead doesn't make sense — Source EDP provides the staffing clients need; Taylor Photo is now working with clients on web graphics preparation — its drum scanner offers clients the sharpest image possible.

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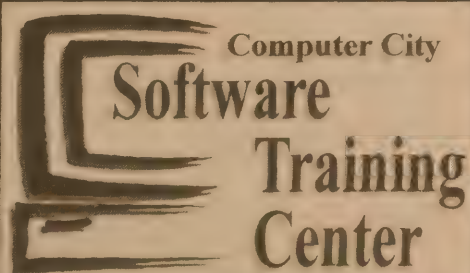
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Many firms believe that true voice mail with auto-attendant functions is beyond their reach — that may not be true, says Total Telecom; Triangle's BLT produces truly bigger than life projects, up to 52 feet wide by 100 feet long, ideal for posters, advertising, and banners.

Continued from page 26

prints for sales or promotional materials. "The end-result is a high quality photograph," says Taylor. "It's a process that is a cost-effective way to produce a large quantity of prints. Instead of paying a premium for dye sub prints, you pay for creating a negative and there is just a nominal cost per print." And you still get the advantage of digital imaging, allowing you to manipulate the print as you wish — from cropping to cutting to adding text, to, as one client requested, changing the color of the sky in a photograph. "The power of digital imaging is that the result is not what the image originally was, but what you want it to be. The power of photography is that it takes you there."

Taylor Photo, 743 Alexander Road, Princeton, 609-452-9444. Fax: 609-452-9517.

Total Telecom

Many small businesses have the right idea. They know that having voice mail can give their business, no matter how small, the appearance of being larger and well established. So a few years ago business owners began to ditch their answering machines for voice mail services offered through their local telephone company. It was the next best thing to corporate voice mail and it was affordable. It was no more than an elaborate answering machine, but it was all that they could afford. Many still believe that true voice mail with auto-attendant functions are expensive and beyond their reach.

"But that's not necessarily true," says Marian Hill, owner and president of Total Telecom of Monmouth Junction. For the past few years, Total Telecom has been selling voice mail systems to small and mid-size businesses in the Greater Princeton Area. "The fact is, for voice mail to be as effective as possible, one needs a longer time to store messages, the ability to transfer calls from one telephone to another, and the advantage of having the phone attended to 24 hours a day, seven days a week."

For an initial investment of approximately \$3,500, businesses can have voice mail system and all the functions that it offers without the monthly fee required by your local telephone company for voice mail services. "That initial investment can provide significant long-term cost savings as well as income potential," notes Hill. With an automatic phone attendant, you have all the responsibilities of a receptionist taken care of and you never have to worry about sick leave, providing salary or benefits. An automatic phone attendant also supports a business' global efforts by being available to calls that may come in from overseas at any hour of the day.

Once a voice mail system is installed, it requires no ongoing maintenance and yet offers consistent, reliable service that guarantees you never miss another message or an order. You not only increase your productivity and efficiency, you can also increase your revenue. And while you can't always be on, your voice mail system can.

Founded in 1993, Total Telecom of-

fers a telecommunications total package—consulting, hardware, software, and service. Total TeleCom sells, installs, and provides expert training for business telephone systems. Total Telecom also provides voice mail systems, and cellular, paging, and long distance services, including the popular prepaid telephone calling cards.

Total TeleCom, 4095 Route 1, Suite 51, Monmouth Junction, 732-329-1503. Fax: 732-329-6138.

Triangle — Your Creative Center

Triangle — Your Creative Center in Princeton can help you make a bold statement with its new BLT large format color output.

The BLT produces truly bigger than life projects, up to 52 feet wide by 100 feet long, ideal for back-lit display boxes and film posters, advertising, art, banners, convention booth headers, corporate wall graphics, courtroom displays, window displays, indoor or outdoor signage that is UV-stable, meeting exhibits, murals, and any type of large-size presentation or promotion.

"When you need to get your message across in a big way, you need BLT output," notes CEO and President Joseph Teti. The BLT can print from any type of original. "Triangle works with you, from concept to completion." BLT reproduces from photographs, mechanicals, or MAC and PC developed images submitted on Syquest or CD.

For such a large format, Triangle can work within the tightest, even same-day, deadline. Recently an area business turned to Triangle to produce large and small format color handouts of the same images for a meeting the next day. "Often clients come through our door afraid that their job will prove impossible, afraid that they won't meet their deadline, their budget, or their vision," comments Teti. "They soon learn that Triangle can meet every and any presentation need."

Being able to send files to Triangle over the phone line, being able to manage any job and meet any client specifications, and being able to deliver a project on time and on budget has brought many area Fortune 100 companies onto Triangle's client roster. Says Teti: "Large or small format projects, our promise is convenience, quality, and on-time service you can trust."

Triangle—Your Creative Center, PO Box 8079, Princeton, 800-357-3776. Fax: 609-896-2250.

Visionet Systems, Inc.

Visionet Systems Takes on the Millennium Bug

It makes computer viruses and bugs seem like nothing and it has businesses rushing for the cure.

It's the millennium bug, the inability of many of the world's computer systems to accurately handle dates past December 31, 1999. That's because their programming code uses only the last two digits of the year, and it's set to assume that those digits all refer to our century. Come the year 2000, they may think it's 1900. Are you due for a retirement payout in January, 2000.

VidEOS: Effective Multimedia for High Profile Clients

While for many years video production had a reputation for being expensive and out-of-reach for many businesses, VidEOS Multimedia in Cranbury challenged that with its well-earned reputation for making video production affordable and accessible to corporations and small businesses alike.

Just a few years ago, video presentations could cost as much as \$50,000 or more. But digital video technology has done to video production what desktop publishing did to graphic design. "Making video production more affordable, however," notes Bill Mutschler, president of VidEOS Multimedia, "has not been at the cost of producing a quality presentation." In fact, continuously changing and improving technology coupled with extensive experience and the resources to develop quality, creative, strategically sound, cost-effective multimedia presentations and speaker-support has led high-profile clients nationwide like Merck, GE, and Glaxo Wellcome to VidEOS Multimedia.

VidEOS Multimedia has been providing presentation, animation, interactive, video, promotional, and consulting services for more than 18 years. The company's success is defined by its approach. "Every project has its own demands. Each solution is created by the client's true needs. Like a journalist, we scope out the story to find out the underlying elements. Doing that allows us to create the right solution. That is exactly what has made VidEOS Multimedia a success — providing the best solution for the client's needs. "You need to consider many

factors — time constraints, budget, desired results, how the presentation will be used, the audience, distribution, and the product's lifespan. It's not simply jumping on the multimedia bandwagon because everyone else is. It's putting your best foot forward and defining the best way to do that."

Clients also look for a vendor whom they can trust. "Earning that trust requires skills beyond one's technical knowledge and talent." Mutschler recalls a client who turned to VidEOS when obtaining project bids. The client had been through a series of discussions in which few production firms would commit to discussing cost item by item. "But experience tells you what a project will likely require. By being upfront and direct with this client we earned their business."

VidEOS has been earning a lot of business lately. Mutschler recently returned from the Asian Telecom Conference in Singapore where VidEOS developed a laptop presentation for a client. VidEOS has successfully completed commercial work for a European client. "The original commercial wasn't pulling well. Their agency knew they needed new vision. By using special effects, desktop tools, and reverse dubbing, the new commercial is now drawing greater attention and sales." Call to request VidEOS' five minute demo tape and view highlights of its top productions.

VidEOS Multimedia, 329 Princeton-Hightstown Road, Cranbury, 609-371-1900. Fax: 609-371-1911. E-mail: VidEOSmm@aol.com. URL: <http://www.videosmm.com>.

You might not get it. Will there be a balance on your credit card in December '99? Your January bill might show interest calculated from 1900.

So without a massive effort to make them year 2000 compliant, nearly all of the world's big computer systems will have big problems in the new millennium. At the individual level correcting the problem is difficult enough. Add up the billions of lines of code running this planet's computer systems and it becomes a logistical nightmare, with computer users facing an absolutely inflexible deadline.

But there is help. Princeton's Visionet Systems has the right solution for the right time for IBM's AS/400, a computer system that has found favor with more than 500,000 business consumers.

Backed by the strength, expertise, and support of Visionet's parent company Systems Limited in Pakistan, Visionet created a sophisticated re-engineering tool, designed and optimized specifically for the AS/400 system, before any of the competition. The company uses a superior technology to go through all those lines of code, find date-related items, and make them year 2000 compliant. Visionet can convert systems for clients, or sell its tools to those who want to carry out the process themselves.

Company CEO Arshad Masood

comments that Visionet was "ahead of the game," much to the relief of its client base. Visionet's timing made the company a leader in a new field with skills and experience beyond those of the competition.

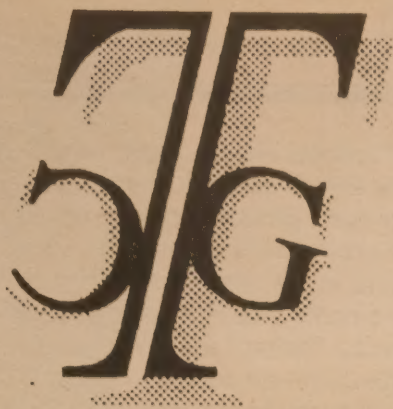
What difference does it make? Ask any of Visionet's Fortune 100 clients, including Abbott Laboratories, Reynolds Metals, International Paper, Nestle, Toys R Us, Liz Claiborne, Tittlest, and Countrywide Home Loans. Ask the client who was scheduling projects and production well into the next century how important year 2000 conversion was to their business. Until the system was converted the client could only schedule work for the next three years on the computer. The rest had to be done by hand and on paper. Prior to Visionet, that client had few options. Work on paper and decrease productivity, or lose business entirely. Visionet solved the problem.

In addition to specializing in AS/400 platform year 2000 conversion, Visionet also provides Euro-currency conversion and multi-lingual and multi-currency support.

Visionet Systems, Inc., 4365 US1, Princeton, 609-452-0700. Fax: 609-452-7148. Web Site: <http://www.visionets.com> E-mail: info@visionets.com

Continued on page 30

Visionet created a sophisticated re-engineering tool, designed and optimized specifically for the AS/400 system, before any of the competition. The company uses a superior technology to go through all those lines of computer code, find date-related items, and make them year 2000 compliant.



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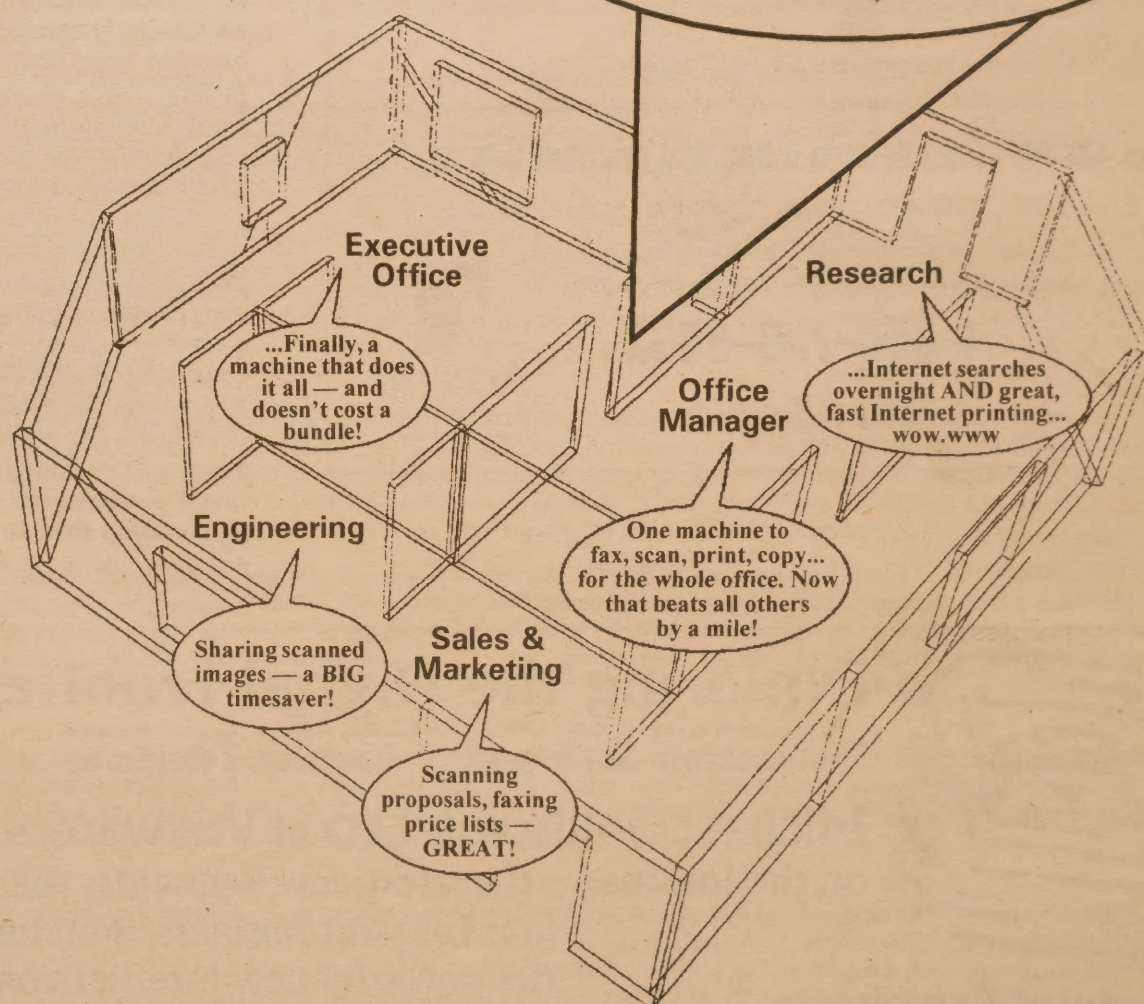
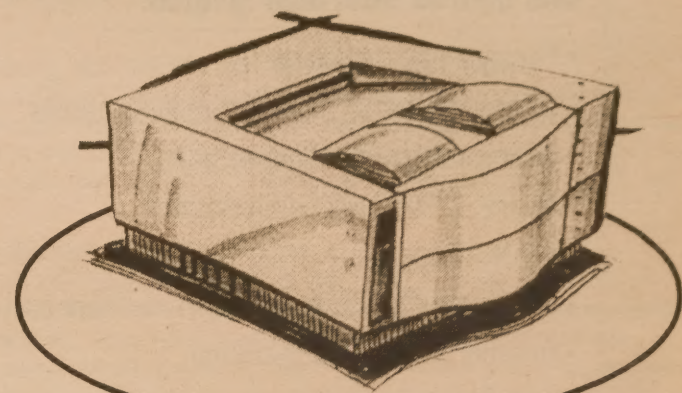
Faxes over telephone or into **Internet**

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Connects to standard LAN

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July 24*

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Xerox people are not just copier experts, they are document experts.

Continued from preceding page

The Document Company, Xerox

Xerox isn't just Xerox anymore. Following its name change in 1994, the 40+ year-old company best known for copiers, The Document Company, Xerox re-focused its efforts on the digital age. "The name change," notes Sherri Smith, Marketing Manager, "is just one way we're trying to show the world that we're not just copier experts, we are truly document experts."

Xerox's product line and services encompass just about anything that touches a paper or electronic document. But that's nothing new. While best known for its copiers, Xerox has long been a technology leader, consistently developing new products and concepts, many of which today we take for granted. Consider the fax machine, color copying, and laser printing. Xerox was also the first to develop a graphical user interface (GUI). And Xerox was also the first to launch a multi-tasking device.

The focus of Xerox has always been to build the company around the customer. "To do that, you must consider the customer's needs, environment, challenges (all of which are constantly changing) and provide an all encompassing, integrated solution of products and services that also support those changing needs," says Smith. Those needs can be anything from making short work of a big project or simplifying one's workday.

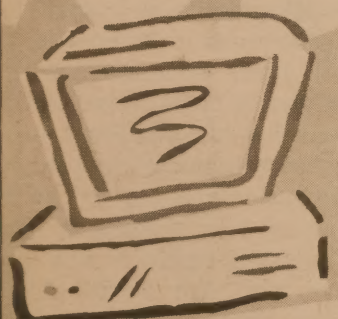
Products like the Document Centre offer clients like M.A. Schapiro & Company productivity support during the short, intense bursts of activity typical in the bank securities industry. Comments Vice President and MIS Director Richard Etzi: "We have a state-of-the-art computer network which is key to our business productivity. When we heard that Xerox had introduced a multitasking digital platform, we had to look at it. It has surpassed our expectations."

For the owner of Clarendon Management, Andrew Hoffman, the Xerox Document Centre System proved to be "a quantum leap over previous technology" with "advanced capabilities and easy-to-use features that added up to time-savings through a happier, less frustrated staff."

The Vice President of Information Services at Case Western Reserve commented that The Document Centre is "a multiplier and an amplifier of the capabilities you already have on your desktop computer."

Having led the first document revolution with the introduction of xerography in 1938, Xerox today leads the second revolution — the digital revolution, all the while using the same strength that helped the company reach success in the first place — focusing on the client.

The Document Company, Xerox, 1-800-ASK-XEROX. 100 Overlook Center, Suite 310, Princeton. Morris Plains: 201 Littleton Road. Woodcliff Lakes: 300 Tice Boulevard. Web site: <http://www.xerox.com>



Exploring the Digital Frontier

Symposium: 5:15 p.m. • Internet Telephony

Michael Goldstein, CEO of Voxware, scoops us on the future of voice on the Internet -- the latest developments, the field of competitors, and what's in it for your business. And he will demonstrate VoxChat, the powerful new Internet voice conferencing tool.

See hands-on demos of new technologies from more than two dozen exhibitors: digital photography, multitasking copiers, flat data displays, object oriented solutions, multi-function document servers, satellite dishes, digital video and more.

Scheduled Exhibitors:

APTECH Worldwide, Inc
C&G Technologies
Clancy Paul Computer Centers
Computer City
Digital Arts & Graphics
Dow Jones Training Services
Haverford Systems
ICM Education Services
Impact Images
Kick Start! Computer & Mailing
Le Cameras and Computers
Mercer County Community College
Morgan Mercedes Computer Training
NextGen Internet
Phone Zone
Prime Star Satellite TV
Princeton Computer Support
Princeton Internet Group
Snelling Personnel Services
Source Services
Taylor Photo
Total Telecom
Triangle - Your Creative Center
VidEOS Multimedia
Xerox, The Document Company
and more!

Thursday, July 24,

Novotel Princeton, Route 1 • 4 to 7:30

U.S.1

1997 Technology Showcase & Symposium

When: Thursday, July 24

Showcase: 4 to 7:30 PM

Symposium: 5:15 PM

Michael Goldstein,
CEO of Voxware
Speaking on Internet Telephony

**Where: Novotel Princeton
Route 1 North**

Admission: Free to U.S. 1 readers

*but please RSVP so we
can have a nametag
waiting for you.*

Computer Showcase Registration Form

Please print neatly or attach a business card.

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☐ Check here for information on sponsoring an exhibit at the showcase.

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Research and Development/Hardware/Software Engineer • Ewing, NJ • \$40,000-\$80,000 • Career Placement

Major technology company seeks a hardware/software engineer to help in the design of the next level of portable digital recorders. Responsibilities include design, manufacture and marketing of portable digital recorders. In this interactive team environment, each individual has a direct impact on the release of each product. Required qualifications include solid experience in firmware design, ASSEMBLY language programming, C++ and Visual C++ programming and digital design for embedded systems. An ability to work alone and on a team and excellent written and oral communication skills are vital.

Systems Administrator • Princeton, NJ • \$55,000-\$60,000 • Career Placement

Major financial information company seeks a systems administrator responsible for all operations systems related tasks during a project cycle and continued production support for these systems. Responsibilities include configuration, installation, acceptance testing, modifications and monitoring of systems. Ability to perform system tuning through information from statistics packages and server resident agent software. Required qualifications include a minimum of 3 years in Stratus VOS Operating System Administration. Experience participating in complete VOS system project implementation cycle and Operations System Support. BS in computer science preferred or equivalent work experience and excellent written and oral communications skills are essential for this challenging career opportunity.

Technical Writers (2 or More) • Lawrenceville, NJ • \$45,000-\$50,000 • Career Placement

Growing business, technology and pharmaceutical/managed care consulting company seeks technical writers to develop program specifications and assist in on-line help systems. Required qualifications include a minimum of 2 years technical writing experience and a strong knowledge and proficiency in Doc-To-Help or Robohelp. On downtime, the individual must be able to perform quality assurance testing on applications. This is an excellent and challenging opportunity for a team player.

Internet-Intranet/Database Programmers (2 or More) • Princeton, NJ • \$40,000-\$60,000 • Career Placement

"New Media" technology company is seeking database programmers for web applications utilizing C++ and other object oriented languages. Responsibilities include web applications development in a client server environment using event driven GUI interfaces. Experience with usability, performance, scalability while doing Internet and intranet development. Required qualifications include a minimum of 2 years programming in C++, C, 4GL, SQL and/or HTML and degree in computer science or the like. Operating systems are Solaris, NT and Windows 95, and databases are Oracle, or SQL server. Development tools such as Sapphire and Webobjects are a plus. Only programmers who "love to play" and work in a team environment are welcome.

Accounting: Junior Accountant/Administrative: Executive Secretary • Mercer County, NJ • \$35,000/\$33,000+ • Career Placement

Prestigious Fortune 500 company seeks 2 dynamic professionals! Junior Accountant: Responsibilities include forecast, budget, analysis, general ledger and credit reports. Required qualifications include BS degree in Accounting and MS Word and Excel. Executive Secretary: Responsibilities include presentations, coordinate seminars, creative projects and client interaction. Required qualifications include MS Word, Excel and Powerpoint. This opportunity provides outstanding benefits, 401(k) and fast promotions to one who is motivated to growth professionally!

Senior Programmer Analyst • Berwyn, PA • \$43,000-\$57,000 • Career Placement

Financial Services software company in Berwyn seeks Senior Programmer Analyst. Responsibilities include fostering team environment, analyzing customer requirements for new and existing systems, leading/assisting impact analysis, creation of scope documents, programming specifications, and designing, writing, testing, documenting, training and implementing programs. Required qualifications include degree, RPG/400 or RPGIII with COBOL/PL1 a plus. 5+ years programming experience in small to large projects, team and communication skills also necessary.

Database Consultant • Berwyn, PA • \$45,000-\$70,000 • Career Placement

Financial Services software company in Berwyn seeks a database consultant. Responsibilities include designing, creating, implementing and supporting physical databases to meet requirements of integrity, efficiency, security and availability. Candidate will research, recommend, and implement tools and procedures to assist information access and provide technical guidance and support to clients. Qualifications include degree, 3-5 years DBA experience with relational databases (Oracle preferred), 2-3 years UNIX, and excellent communication and problem solving skills.

Database Developer • Philadelphia, PA • \$40,000-\$50,000 • Career Placement

Insurance firm seeks individual to design, implement and test applications providing customers with information in a user friendly format. Duties include discussing, planning, designing, implementing, testing and monitoring info systems projects, developing systems using Oracle, supporting and developing applications written in Microsoft Office products, and limited Novell LAN backup and PC support to end users. Requirements are as follows: Degree, 2+ years PC hardware and software experience, Oracle or similar, Novell and spreadsheet knowledge. Insurance/UNIX/COBOL experience a plus.

Trading Systems Developer • Philadelphia, PA • \$ - Dependent on Experience • Career Placement

2 positions (1 senior, 1 junior) available at major international financial organization. Positions require the following: Degree, 4+ years experience (6+ for senior position), C, UNIX or VOS (Stratus) or VMS (DEC), GUI experience (X, Motif, XView, MS windows, Visual Basic or C, Delphi), multiple process concepts, and relational database knowledge (preferably embedded SQL). Also UNIX shell programming and tools, networking (ISX/SPX, TCP/IP, Token Ring). Secondary requirements include securities experience, real time processing experience and COTS middleware products experience. The senior position also requires experience in a multi-platform environment and in a leadership role.

Sales Consultant • Philadelphia, PA • \$65,000- • Career Placement

Great opportunity for individual with 5+ years supply chain or other manufacturing software. Philadelphia-based with extensive travel. Consultative selling skills, computer technology knowledge important. Excellent presentation, demonstration and communication skills. Base salary \$65,000, earnings at quota \$125,000. No cap on earnings and stock options available based on performance.

Account Executive/Tradeshows Manager • Central NJ • \$50,000-\$60,000 • Career Placement

Top international exhibit/tradeshows firm seeks a dynamic, driven and seasoned account executive with 5+ years in the tradeshows industry. Responsibilities include managing multiple Fortune accounts, logistics, floor plans, sales/marketing, coordinating all aspects, troubleshooting and negotiating. Travel a must! Highly growth oriented in a creative team environment. Healthcare and/or telecommunications experience a plus and dedication a must!

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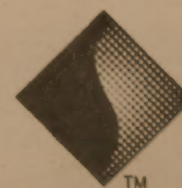
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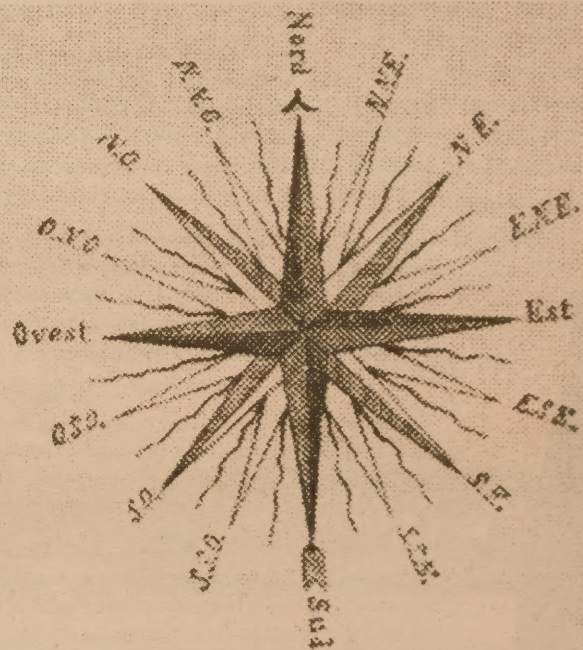
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